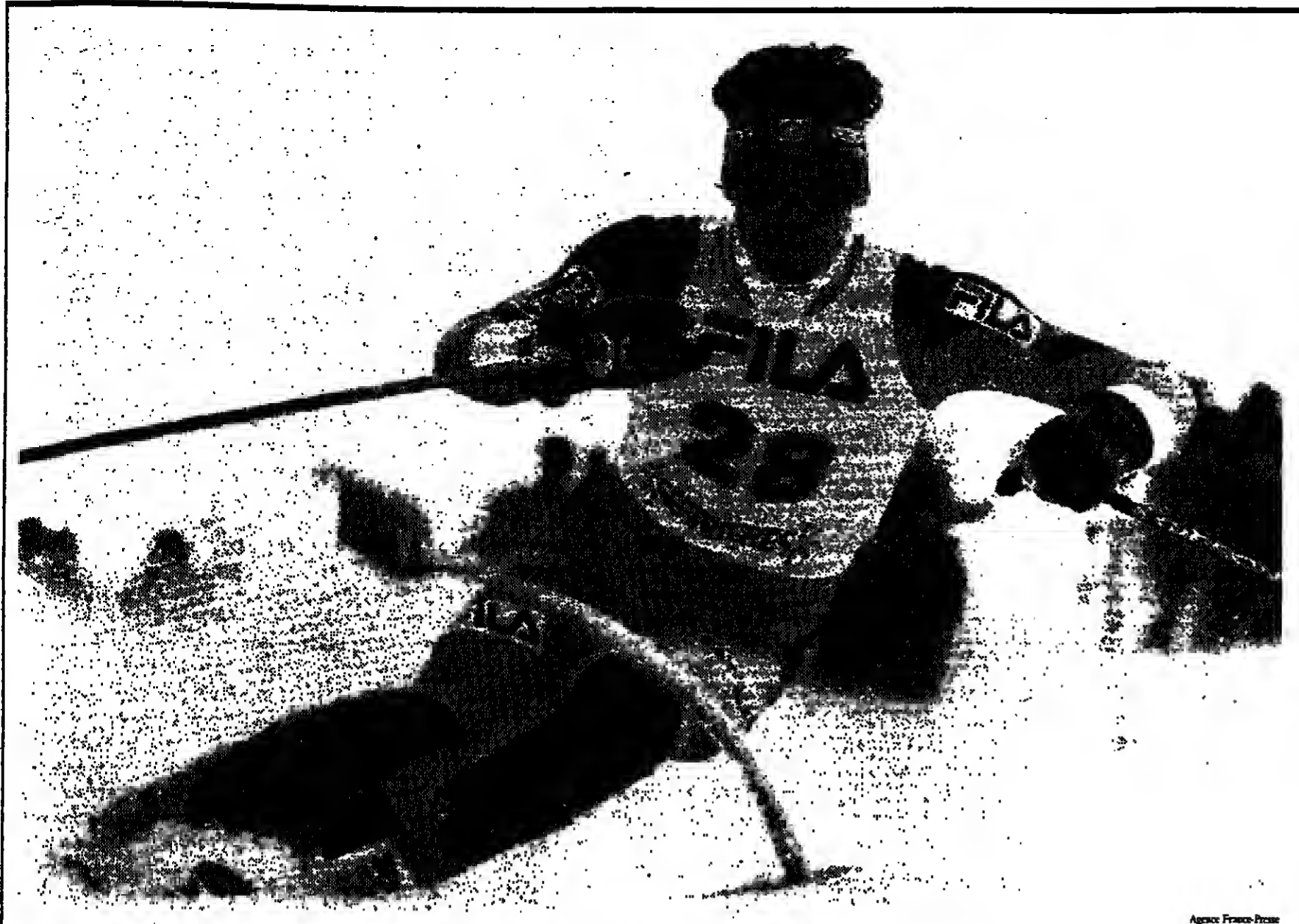


Table with exchange rates for various countries including Australia, Austria, Belgium, Bulgaria, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, India, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, U.S., and U.K.



Tomba Bombs in Italy as Tescari Triumphs in Season's First Slalom. Fabrizio Tescari of Italy negotiating the slalom course in Sestriere, Italy, on Sunday, the second day of the World Cup slalom season. Tescari was the surprise winner as his compatriot Alberto Tomba fell and two other favorites, Kjetil-Andre Aamodt of Norway and Paul Accola of Switzerland, missed gates. In the season-opening giant slalom, Aamodt edged Tomba by almost half a second, silencing the thousands of fans who had come to cheer on the Italian star. Aamodt, 21, called it his "greatest win ever." Page 27.

Israel Torn On Reply To German Nazi Surge

By Clyde Haberman New York Times Service JERUSALEM — In the last few days, this country has balanced the demands of diplomacy against the anguish of its soul in trying to decide how a Jewish state — the Jewish state — should respond to the neo-Nazi surge in Germany. Politicians on both the left and the right have called for a worldwide Jewish boycott of Germany and for Israel to sever diplomatic relations unless the German government acts more firmly and swiftly than it thus far has to fight racism and anti-Semitism. After debating the matter for three and a half hours on Sunday, the cabinet of Prime Minister Yitzhak Rabin settled on a middle course: It issued a statement sharply condemning the ugliness that has re-emerged in Germany and urging the Bonn government to take action. But it avoided any hint of what, if anything, Israel might do should the xenophobic thuggery continue. History assigns Israel a special obligation to speak out, Mr. Rabin later said in Tel Aviv. "You must not let things develop from the beginning," he said. "You must crush the head of the snake when it's still small." A government official said, "It's really a very tight rope here, and one should walk it very carefully." After all, he added, Israelis tend to bristle whenever outsiders lecture them about what they are doing wrong in their treatment of Palestinians in the occupied West Bank and Gaza Strip. Along a similar line, Tourism Minister Uzi Baram, a Labor Party liberal, emerged from the cabinet meeting saying that Israel had to be cautious about condemning Germany because extremists exist in Israel as well. He cited the Kach Party of the late Meir Kahane, which courts barred from participating in the national election in June because of anti-Arab positions that the judges called racist. Does he really equate these relatively few Israeli militants with the many German radicals? Mr. Baram was asked. "From the viewpoint of the depth of support they receive — no," he replied. "From the viewpoint of the phenomenon — yes." Like many Jews in other countries, Israelis have mixed emotions about Germany. Some will not go near the place, including people who were born in Israel and did not lose a single relative in the Nazi Holocaust. For them, buying a Volkswagen is morally equivalent to blasphemy. But obviously not everyone shares their conviction, or else there would not be so

Kohl Vows To Step Up War Against Extremists Germany's Parties Fail To Resolve Dispute Over How to Limit Refugees

By Marc Fisher Washington Post Service BERLIN — Chancellor Helmut Kohl said Sunday that Germany was determined to rid itself of its neo-Nazi cancer even as the country struggles to overcome the economic recession and psychological ills that have befallen it since the 1990 reunification of the two Germans. In a radio interview, Mr. Kohl made his strongest statement yet on Germany's resolve to stem the 1,900 anti-foreigner, anti-refugee and anti-Semitic attacks that have left 16 people dead this year. "We must do everything to put the right-wing rabble in their place and hit these culprits with the full force of the law," he said. But in Bonn, a move by the major political parties to end more than a year of squabbling over how to restrict the entry of refugees into Germany ended in impasse after more than 30 hours of crisis talks. The German government said Saturday that it was considering stripping extremist leaders of their basic constitutional rights to vote or express their opinions, a move that would broaden Bonn's war against continuing violence by neo-Nazis. The Interior Ministry said it may ask the nation's highest court to enforce a constitutional provision allowing the government to deny basic rights to anyone who "abuses freedom of expression to combat the free democratic basic order." German police officers this weekend raided dozens of homes of neo-Nazis, confiscating weapons and propaganda, while the government banned a small extremist group, one of 26 neo-Nazi organizations under federal surveillance. The highly publicized crackdown failed to stop the violence, as neo-Nazis and skinheads attacked eight refugee shelters, and skinheads fought with Turks in at least two cities. A refugee home in the Eastern town of Eberswalde was gutted after extremists threw gasoline canisters into the building, which had been attacked by stone-throwing thugs two months ago. In the Western town of Rinteln, neo-Nazis burned a restaurant owned by a German and his Vietnamese wife. The restaurant's walls were covered with swastikas, SS symbols and slogans such as "Stieg Hell" and "He who does not run will burn." In unusually direct language, Mr. Kohl said Germany was plagued by racist violence, economically troubled and unable to accept the expanded global role that Washington and other allies had envisioned for Bonn after the collapse of communism. "It has to be recognized that we have a worldwide economic recession and that the economic upturn has ended after eight great years," he said. Mr. Kohl called on German

As Russia Defies the Economic Dark, Politics Looms

By Steven Erlanger New York Times Service MOSCOW — A year ago, reports from here were full of dark warnings about starvation, destitution, chaos and rages as the Soviet Union lurched toward its end. This has not been a wonderful year for the Russian economy, as an inexperienced government tries to manage an extraordinary transition to a capitalistic system. There is more poverty, purchasing power is down, industrial production has dropped to 75 percent of what it was a year ago, inflation is running at 25 percent a month and the ruble is hovering around 450 to the dollar, compared with 135 at the end of June. But as the nation prepares for a meeting this week of its highest legislative body, which some expect to challenge President Boris N. Yeltsin, Russia is not starving. There is little unemployment. President Boris N. Yeltsin urges his supporters to form a new political movement. Page 2. ment and more than adequate supplies of food in the stores, some of it still subsidized and more of it costly. Though the amount of money in people's pockets buys less and consumer spending is down to half of last year's figures, food consumption has remained at levels equivalent to that in the early 1970s. In the meantime, increasing numbers of ordinary people, especially younger ones, are learning how to make money in a free economy and to fend for themselves. The privatization of small enterprises has been increasing every month, and there is a lot of retail trade, especially in the cities. But such wholesale change of a state-run economy has produced a large group of politically powerful critics, most of whom have privileges to lose, especially among the managers of large state farms and enterprises. Gathered around a soothing lobbyist, Azkadi I. Volsky, and a powerful parliamentary faction known as Civic Union, they are pressing the government of Mr. Yeltsin and acting Prime Minister Yegor T. Gaidar for a slower, more managed transition to the free market. Civic Union is pushing for further state support for industrial production and conversion, as well as the protection of jobs. It represents the "centrist" opposition to the government in the upcoming session of the Congress of People's Deputies. Earlier Western warnings that Mr. Gaidar's proposed economic overhaul could be gutted by Civic Union have been toned down. With the Russian government managing to reassert some control over the economy in the last month — reducing the enormous growth of

European Regulators Alarmed By Rise in Nuclear Smuggling

By Steve Coll Washington Post Service MUNICH — Investigators looking into a recent rash of European criminal cases involving illicit smuggling and sale of radioactive materials say they have found evidence of thefts from former Soviet and East European nuclear plants, both commercial and military. While the evidence accumulated so far is fragmentary and the nuclear materials seized from smugglers would be of little immediate use to an aspiring atomic bomb manufacturer, investigators say they are worried about the emerging patterns of illicit nuclear trafficking in Europe. Scores of people, mainly East Europeans, have recently been arrested in West European hotel rooms, private homes, city parking lots and Autobahn rest stops while trying to sell everything from tiny flakes of plutonium to several pounds of lightly enriched uranium to package deals combining radioactive materials with such conventional weapons as tanks and artillery pieces, according to police, regulators, prosecutors and customs officials. German policemen have investigated more than 100 cases this year involving smuggled nuclear material, up from 29 in 1991, according to Hans-Ludwig Zachert, who heads the Federal Crime Office. Evidence in the cases suggests that freelance con artists and small groups of criminals are crossing borders opened after the end of the Cold War in search of quick profits from potentially dangerous radioactive contraband, and that the smugglers are using routes and methods adapted from Europe's heroin and illicit cigarette trades, in which some of the arrested nuclear smugglers also participated. No evidence has yet emerged of extensive or state-sponsored organized crime rings trading in radioactive materials, according to investigators. Some of the recent cases have apparently involved con men who made wild claims about relatively worthless nuclear waste to extract large sums of money from gullible buyers. But several aspects of the cases offer cause

Kiosk Tehran Bought 3 Submarines

TEHRAN (AFP) — Iran will soon receive two more Russian submarines, the country's naval chief said Sunday. It was the first time Iran had disclosed the purchase of three submarines from Russia. Western military sources previously said that Tehran had purchased two vessels with an option on a third. Rear Admiral Abbas Mojtaj said the two submarines would be delivered "in the near future." The first vessel was delivered last week. General News Vienna fears being sucked into the turbulence in its former imperial possessions. Page 6.

Tokyo Cools It With Clinton

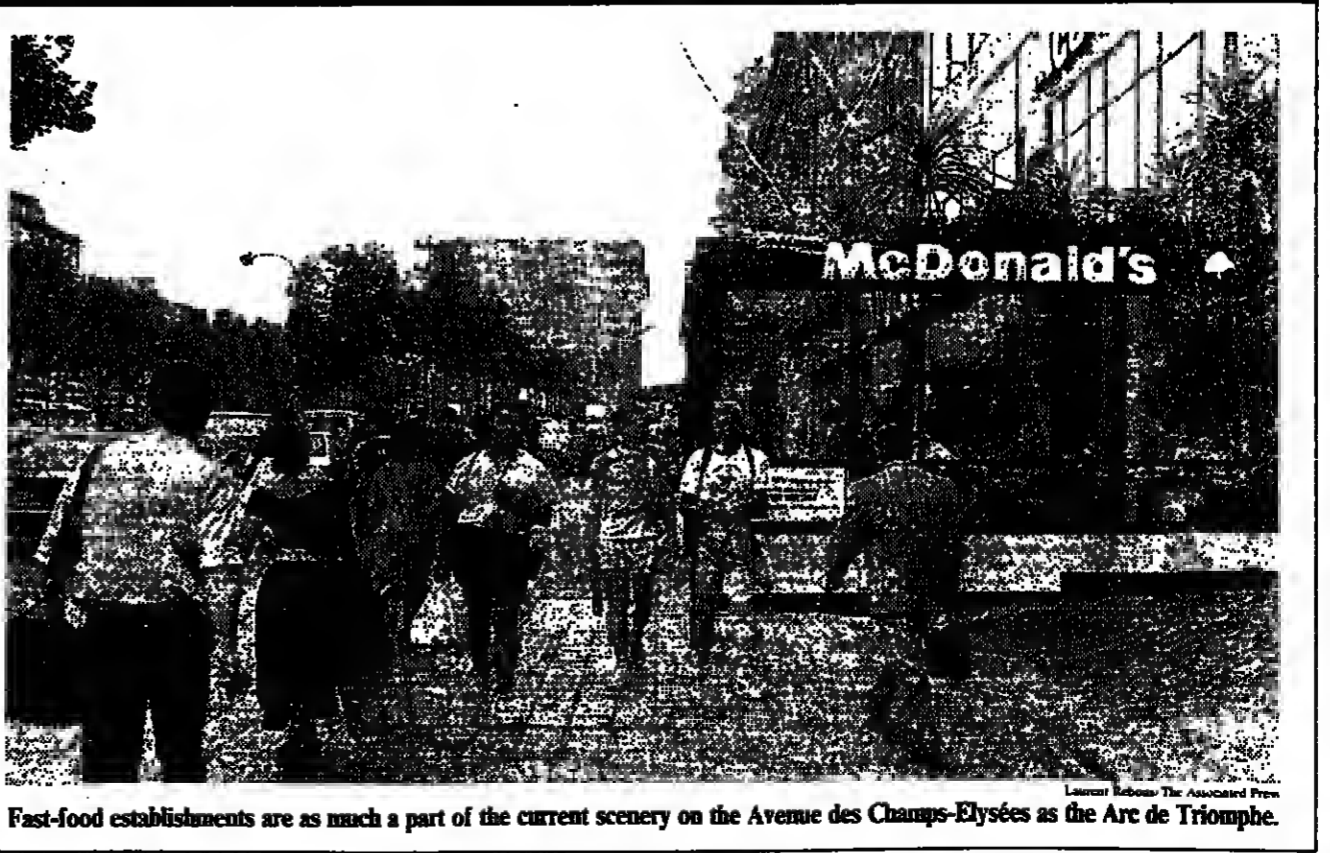
By David E. Sanger New York Times Service TOKYO — The Japanese government is spreading a quiet message to the hundreds of bureaucrats, businessmen and politicians who hop trans-Pacific flights every week to the United States: Visit your factories, play lots of golf, but stay out of Little Rock. As President-elect Bill Clinton assembles his transition team, Japanese officials, who openly rooted for the loser, say they are fearful that an overly eager rush to build bridges with the Democrats could prompt a postelection backlash. After a campaign marked by repeated criticism of foreign lobbyists — and promises by Mr. Clinton to raise \$45 billion in new revenue by taxing foreign companies more heavily — there are words of caution. A task force at Japan's Finance Ministry is already producing reams of paper about how trade policy may change in the new administration, and the foreign minister, Michio Watanabe, is fishing for pre-inauguration talks with Clinton and his advisers. But several officials warn that it would be unwise to press Japan's case before Mr. Clinton's economic team is in order. "I'm telling my people not to make haste," said Noboru Hatakeyama, vice minister of International Trade and Industry, which has the most at stake as the new administration comes to power. "Every once in a while the question arises, and someone wants to get in touch with the new crowd. But perhaps it is better to wait." Japanese business executives say that they have not received any formal directives from the government over how and when to approach the new administration. But several executives report informal cautions against quickly and conspicuously changing lobbying

Kohl Rules Out Council Seat Now

BERLIN — Chancellor Helmut Kohl said Sunday that even if Germany were offered a seat on the UN Security Council, it was in no position to accept one. "We cannot live up to our full membership," Mr. Kohl said, citing parliament's failure to agree on a new role for its military, which traditionally has been barred from United Nations peacekeeping missions or other coalitions outside NATO. "We've got other problems that take priority," the chancellor said. The fact that Bonn felt obliged to withdraw its destroyer from the UN force off Yugoslavia because of a UN decision to search suspicious vessels "puts a spotlight on the psychological situation we have here," he added.

Reviving Charm of the Champs-Elysées

By Mary Blume International Herald Tribune PARIS — The Champs-Elysées, probably the most famous avenue in the world, site of triumphal parades, tacky shops and petty crime, is once again about to be saved. The vigorous if limited plan of the city of Paris is called the Mission Champs-Elysées. Sidewalk parking has been banned, and underground car space is being built. Where cars once parked, a second row of plane trees will be planted, and the uneven sidewalks will be smoothed to a uniform width of 2.5 meters (8 feet) and covered in three shades of granite, none, unfortunately, impervious to chewing gum. The designer Jean-Michel Wilmotte is creating new street furniture and lighting; cafe terraces will all have awnings of red or blue. Street peddlers will be banned. Advertising on facades is to be strictly controlled, as are changes to buildings and shop windows. Six sites have been inscribed on the list of historic monuments and more may be added. The tree planting and parking will rush to an end by late 1994. "The rest of the job is larger in scope and more homeopathic," says the Mission's Patrick Pogonat. A group to protect the avenue was founded as early as 1913; in 1916, Louis Vuitton headed the first defense committee of grand hotels or restaurants. There are pinball parlors, fast-food restaurants, souvenir shops. Hardly anyone still lives on the avenue, and about 60 percent of its real estate belongs to insurance companies and banks. In the '70s, the RER express subway opened the Champs-Elysées to crowds of bored youngsters from the poorer suburbs in search of a good time and, sometimes, a fight. Crime statistics are not readily available, but a retired policeman managed a 339-page memoir out of his adventures on the avenue. The Mission Champs-Elysées grew from a protest when Fouquet's, the avenue's most famous restaurant, was threatened because its new owners wanted to make it into a shopping mall. Under the leadership of Maurice Cazeneuve, former head of French public television, Fouquet's customers — "who aren't just anyone," he points out — appealed to Culture Minister Jack Lang to have Fouquet's made a historic monument, although of no architectural interest. A new category was invented: Fouquet's was called a lieu de mémoire and cannot be touched. Mr. Cazeneuve is now head of a group for rehabilitating the Champs-Elysées and of the Comité Triomphe, an umbrella group including the Comité George V and the Comité Montaigne, the lustrous avenues that com-



Fast-food establishments are as much a part of the current scenery on the Avenue des Champs-Elysées as the Arc de Triomphe.

TRANSITION / THE PEROT FACTOR - 1996

★ POLITICAL NOTES ★

Clinton Urged to Redefine Intelligence Needs

WASHINGTON — Congressional Democrats who advise President-elect Bill Clinton say he will need a more complete and timely analysis of the messy problems of civil wars, ethnic conflicts and economic competitiveness. Although in 1990 CIA analysts correctly predicted the ethnic turmoil that would result from the breakup of Yugoslavia, for example, the first reports of Serbian death camps were reported in August not by covert operators on the ground but by Newsway.

"The Clinton administration will be faced with a number of serious diplomatic challenges early on that will require more timely, objective and relevant intelligence," said Representative Dave McCurdy, the Oklahoma Democrat who is chairman of the House Permanent Select Committee on Intelligence. "The Bosnians and the Somalis will be the rule rather than the exception in foreign policy, and that requires a different focus."

To meet those needs, Mr. McCurdy and other influential Democrats say that Mr. Clinton will have to redefine his intelligence needs. At the moment, policymakers bombard the CIA and other intelligence agencies with across-the-board requests, from the big issues like North Korea's nuclear threat to minutiae, like the length of a Somalia's airstrip or the size and location of an Albanian exodus. Democrats also recommend that Mr. Clinton place greater emphasis on reporting from spies on the ground and on analysis of publicly available information. "A satellite photograph cannot detect the actions of a terrorist making explosive devices in an abandoned building," Senator David L. Boren, the Oklahoma Democrat who is chairman of the Senate Select Committee on Intelligence, wrote recently in Foreign Affairs.

Mr. Clinton has chosen two longtime Capitol Hill aides to handle intelligence issues during the transition: George J. Tenet, the staff director for the Senate intelligence committee, and John G. Keilher, his counterpart in the House. Both men played important roles in developing legislation introduced by their committees earlier this year to reorganize the U.S. intelligence agencies. More important, they enjoy the respect of Congress and the intelligence bureaucrats.

Mr. Clinton has given no hint of his choice for the next director of central intelligence. Mr. McCurdy and Mr. Boren have urged the president-elect not to rush to push Robert M. Gates out of what is supposed to be a nonpolitical job.

"I didn't support him when he came in, but I've come around," Mr. McCurdy said. "Gates has tried very hard." (NYT)

New Women Senators Seem Judicial Panel

WASHINGTON — The Senate Judiciary Committee, decided since the Clarence Thomas-Amita F. Hill hearings and attacked in the campaigns of female candidates, has been scorned anew. It turns out that none of the women elected to the Senate on Nov. 3 wants to serve on the committee they ran against.

Because Senate leaders recoil at the idea of another nationally televised Supreme Court nomination reminding the country of the overwhelming whiteness and maleness of the Senate, some sort of deal is likely to be made. One possibility could involve giving a seat on the Appropriations Committee to whichever female senator will take the Judiciary Committee.

In the meantime, Judiciary Committee staff members, still smarting from the criticism the committee has received, find it ironic, even hypocritical, that newly elected women senators are resisting the committee. "Why can't they put their money where their mouth is?" asked a counsel for a committee member.

And it is not as if the chairman, Joseph R. Biden Jr., Democrat of Delaware, has not been trying. After her victory in the Democratic Senate primary in California, Representative Barbara Boxer received a dozen red roses, hand-delivered by Mr. Biden with a note saying, "Welcome to the Senate Judiciary Committee."

He continued to woo her and the others, campaigning for them in their states and, most recently, cosponsoring Dianne Feinstein, another new Democratic senator from California, at a party for Mr. Clinton at the Washington home of Pamela Harriman.

But Mr. Biden apparently has not done enough. None of the women is making the committee a priority in requests to the Senate leadership, although some have not ruled it out as part of a deal.

All the women made the committee an issue in their campaigns. A month after the October 1991 Thomas-Hill hearings, for example, Representative Boxer ran a commercial that opened with a shot of the panel and a close-up of Senator Strom Thurmond, Republican of South Carolina, who turns 90 on Dec. 5. "It hit me how out of step the Senate is, how out of touch they are," she said. (WFP)

Packwood Ready to Aid Probe of Conduct

WASHINGTON — Senator Bob Packwood says he will request and cooperate in an ethics committee investigation of his treatment of female staff members and lobbyists who said he made unwanted sexual advances toward them. He also said he would seek counseling for what he described as his "problems" with alcohol.

The decision by Mr. Packwood, 60, Republican of Oregon, issued in a statement by his Oregon office, was made after a half-dozen women's rights groups urged a Senate ethics probe into his conduct. In Los Angeles, Gloria Allred, president of the Women's Equal Rights Legal Defense and Education Fund, said she had written to the Select Committee on Ethics and asked for a "full, fair and prompt inquiry into this scandal." (WFP)

Quote-Unquote

Senator Packwood, in a statement in response to the charges against him: "Upon reflection, I realize I have problems and will seek professional advice in connection with my use of alcohol." (WFP)

Betty Roberts, spokeswoman for a coalition of Oregon groups that seeks his resignation: "The statement is not adequate." (WFP)

Away From Politics

- The landing gear of a Mexican Airlines Airbus 320 collapsed as it rolled toward takeoff at Los Angeles International Airport with 150 passengers aboard. The pilot brought the plane to a stop, and no one was injured, officials said. The plane was bound for Mexico City.
- A bureaucratic tangle in federal aid regulations has tied up \$60 million intended to rebuild apartments destroyed or damaged by the hurricane in Florida.
- The two beagle whales that died a month after arriving at the John G. Shedd Aquarium in Chicago were probably killed by a reaction to an anti-parasitic medication, the aquarium said.
- The mayor of Passaic, New Jersey, Joseph Lipari, was convicted on five U.S. tax charges and two counts of conspiracy for entering a \$150,000 kickback from a meat doing business with the city.
- A Titan IV rocket carrying a secret government payload was launched at Vandenberg Air Force Base, California, officials said.
- The New York state energy commissioner has asked oil companies and gasoline retailers in the New York City area and on Long Island to explain larger-than-expected price increases for cleaner-burning gasoline that went on sale in November under new state regulations intended to reduce air pollution.

AP, NYT

Venezuela Leader Admits Errors but Will Not Resign

Compiled by One Staff From Dispatches

CARACAS — President Carlos Andrés Pérez said in a broadcast speech on Sunday, after the second coup attempt against him this year, that he had no intention of resigning.

"That is something which I have never been prepared to do and am not prepared to do," he said.

Mr. Pérez, who was elected in 1989 to a five-year term, acknowledged that his government had committed errors since taking power and had not convinced Venezuelans of the need for economic reforms he put into effect.

But he said this did not justify the violence of the uprising, in which about 170 people were killed and many others wounded.

Also, at least 100 prisoners were killed during the coup attempt and its aftermath when they tried to escape from the Catis prison in the capital, according to the governor of Caracas, Antonio Ledezma. In a statement on Sunday, Defense Minister Ivan Jiménez Sánchez identified 10 senior members of the armed forces who he said were behind the coup attempt.

He identified the most senior members of the coup leadership as Rear Admiral Hernán Gruber Ordeman, Brigadier General Francisco Visconti of the air force, who has fled to Peru, and Rear Admiral Luis Cabrera Aguirre.

Officials said about 1,300 participants in the uprising had been detained. (Reuters, AFP)



Mr. Clinton trying his hand at volleyball in Santa Barbara, California. He found the game while jogging.

Republicans Prepare for Filibusters

By Paul F. Horvitz

International Herald Tribune

WASHINGTON — The filibuster, a legislative tactic used by the minority to delay a vote by the majority, could become a preferred Republican tool during the Clinton presidency, Senator Bob Dole, the Senate minority leader, indicated Sunday.

Its use could frustrate the incoming Democrat, Bill Clinton, whose campaign laid out an ambitious agenda for Congress amid public anger at partisan bickering in Washington.

Under Senate rules, Mr. Dole, a Republican from Kansas, will need 41 of the 100 Senate votes to prevent a bill from coming to a vote. Republicans will hold 43 votes in the new Senate, to the Democrats' 57.

Mr. Dole said in a television interview that he could foresee Republican-led filibusters on at least two issues — legislation to bar companies from permanently replacing workers who are on strike and any measure that would hold senators to different campaign finance limitations from those for

members of the House of Representatives. The strike-replacement bill is being pushed by organized labor, and the two parties have long been at odds over campaign finance reform.

In a filibuster, once senators favoring a bill fail to muster the 60 votes needed to end debate, opponents often talk round the clock to delay action on the measure. The tactic is used so frequently that many senators simply direct a memo to the leadership stating a filibuster is imminent; that either prevents the bill from coming to the Senate floor in the first place, or results in a compromise.

Depending on one's point of view, a Republican-led filibuster could be labeled partisan obstructionism — gridlock. Or it could be seen as an unpleasant but necessary means of preventing Democrats from railroading legislation through Congress with a Democratic president waiting to sign it into law.

Mr. Clinton, meantime, prepared to return to his office in Little Rock, Arkansas, on Monday after a four-day vacation in California. He is expected to begin announcing cabinet officials early in December, and is likely to name a Treasury secretary in advance of a Dec. 14-15 economic conference with business, labor and consumer leaders. Mr. Clinton will take office Jan. 20.

Loser's Voters Already Wooed Clinton Team Sees Perot's Backers as Crucial

By Thomas L. Friedman

New York Times Service

WASHINGTON — Just as Ross Perot managed to reshape the 1992 presidential campaign merely by hovering around its edges, his shadow is now influencing the emerging strategy of the Clinton administration.

Mr. Perot is back in Texas, quiet for the moment, and the potential power of his supporters, who are reorganizing, is still uncertain. But aides to President-elect Bill Clinton are well aware that one in five voters chose Mr. Perot, whose backers have warned that they intend to lobby the Clinton White House for their programs.

With that in mind, Mr. Clinton's team is tailoring parts of its public relations and governing strategy to win them over.

"I can't believe I am talking about 1996 before Governor Clinton has even been inaugurated," said his communications director, George Stephanopoulos, "but assuming that 1996 will be a two-person race, then the Perot voters will be central to that election. They have to be part of our thinking. They will be the difference between winning and losing."

Considering that Mr. Clinton got 43 percent of the vote, President George Bush 39 percent and Mr. Perot 19 percent, said David Wilhelm, director of political affairs for the Clinton transition team, "it is an important political objective of ours to reach out to those folks in the coming months."

Reaching them, though, may not be easy, because Clinton and Perot advisers have different views about how to attract the Perot constituency — the hard-core followers who are trying to create a political organization, as well as the millions of sympathizers whose political affiliations are uncertain.

Clinton aides say that to transform these voters into Clinton supporters in four years, the president-elect will use a variety of Perot-style techniques, from town hall meetings to toll-free phone numbers, to appeal to their demand for unmediated, direct contact with decisionmakers.

His aides say that Mr. Clinton will also heavily stress issues that appeal to the hunger of Perot voters to "clean up the mess in Washington" — such as overhauling cam-

aign finance laws and limiting special-interest lobbying.

Mr. Clinton wants to adopt some of these techniques and tackle some of these issues for his own reasons, partly to get around the press and partly because the issues are ones he cares about. But they are being given added attention because of the Perot factor, aides say.

Although Mr. Clinton intends to focus on reducing the deficit and national debt, Mr. Perot's primary issues, he is still open to the possibility of increasing the deficit in the short term in order to stimulate the economy, and seems uncertain about how quickly and deeply he intends to cut the national debt.

But the Clinton team believes that for Perot voters these issues

are symbols of the mess in Washington. They say they can avoid taking them on immediately, provided they convey a sense that they are energetically and effectively addressing such national problems as health care, job growth or welfare.

Mr. Perot's supporters strongly disagree with the president-elect's advisers.

They contend that the \$4 trillion national debt and the large deficit are not just symbols of government in gridlock. They view these problems almost theologically — like elements of a looming apocalypse.

"You can't pay them off just by going after lobbyists or the Japanese," said James Squires, Mr. Perot's former spokesman. "You have to go after the deficit and debt."

For a Texas Senator, A Home at 50% Off

By Jeff Gerth and Dean Baquet

New York Times Service

WASHINGTON — Senator Phil Gramm, a leading member of the Senate Banking Committee, helped guide a troubled Dallas savings and loan operator in dealings with U.S. regulators one year after the executive had picked up nearly half of about \$117,000 worth of building expenses on the Texas Republican's waterfront vacation home in Maryland.

In 1987, Jerry D. Stiles, then a prominent home-builder and developer in the Dallas area, took on a project for Mr. Gramm and his wife, who had bought more than 35 acres (14 hectares) on a remote part of Maryland's Eastern Shore and needed a contractor to finish construction on the shell of a two-story house.

Mr. Stiles also owned three Texas savings and loans, which later failed and which regulators say will cost taxpayers more than \$200 million.

Mr. Stiles assembled a crew of workers in Texas, led by a skilled craftsman, and flew them to Maryland. There, lodged in hotels, they worked for a few months to finish the Senator's 2,815-square-foot house along the banks of the Honga River.

In constructing the interior of the house, Mr. Stiles advanced the \$117,000 — interest free — for labor, materials and travel expenses that the job was said to have finally cost. But he over billed the senator for anything until three months after the work was finished, and then he asked for only \$63,000 — the maximum that Mr. Gramm had told Mr. Stiles he was willing to pay.

At least two U.S. agencies, including the FBI, examined the relationship between the senator and Mr. Stiles, in 1989 and 1990, according to documents and interviews. But the government decided not to investigate further, partly because the Senate Select Committee on Ethics subsequently decided in January 1990 that the senator had not unethically accepted something from Mr. Stiles and did not owe him any money.

Both he and Mr. Stiles have described the extra expenses to Senate investigators as a cost overrun that Mr. Stiles willingly assumed.

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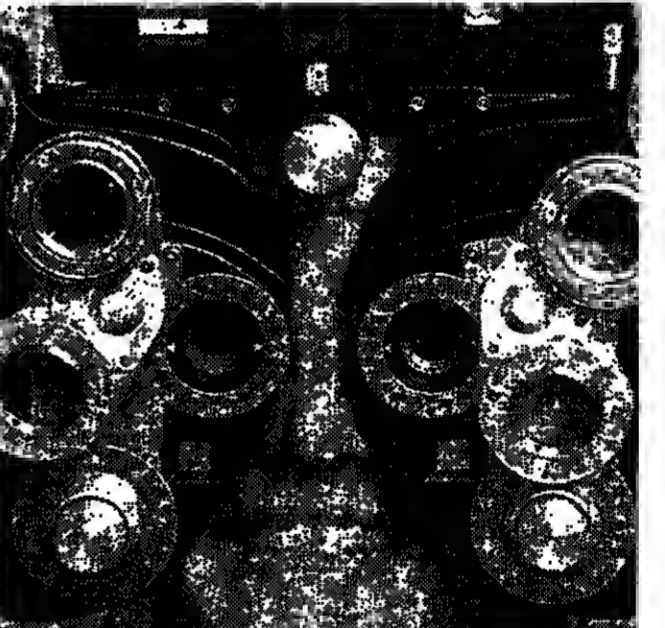
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No Talks, Bosnians Tell Wiesel

Meeting Barred With 'Murderers'

Compiled by Our Staff From Dispatches

SARAJEVO — President Alija Izetbegovic of Bosnia-Herzegovina rejected on Sunday a proposal by the peace activist Elie Wiesel to meet Serbian leaders in Paris, calling them "the murderers of our children."

Mr. Wiesel, visiting detention camps in Bosnia and checking reports of human rights violations in the former Yugoslavia, suggested a meeting involving Radovan Karadzic, a leader of Bosnian Serbs, and President Slobodan Milosevic of Serbia.

Mr. Izetbegovic replied: "This is not an ordinary war, this is genocide. You can meet your enemy, but you can't meet the murderers of your children. Our people see murderers in them."

Mr. Wiesel, the winner of the Nobel Peace Prize in 1986, replied: "Mr. President, they say the same thing. That is the biggest problem."

As shells burst and machine-gun fire rattled not far from the presidency building in the besieged city, Mr. Wiesel accepted a book detailing alleged atrocities against the people of Sarajevo, but said it was too early for him to comment or form conclusions.

In other developments: Heavy fighting was reported between Croatian and Serbian forces in Bosnia just a few hours before a cease-fire deadline. The Belgrade-based Tanjug news agency reported that Croatian army units attacked Serbian positions around Orasje and Brecko overnight Saturday and stepped up the attacks on Sunday.

NATO warships intercepted the first vessel caught breaking the UN embargo imposed on Serbia and Montenegro, and escorted the Maltese-flagged ship to an Italian port, a NATO spokesman in Naples said.

A United Nations war-crimes commission decided to dig up a cornfield near Ovcara, Croatia, that investigators say could be a mass grave. Officials say the field could hold the bodies of 300 people believed to have been killed by Serbian forces in November of last year.

The investigators say they believe that the cornfield is a mass grave for civilians and Croatian soldiers who were all taken from a hospital after the fall of nearby Vukovar to Serbian forces.



Muslim refugees doing laundry on Sunday in a camp at Travnik, Bosnia-Herzegovina.

KOHL: Chancellor Vows to Step Up War on Rightists

(Continued from page 1) unions and workers to accept low wage increases.

In Bonn, leaders of parliament's four major political parties failed to agree on how to limit the ability of refugees to enter Germany. About 500,000 refugees are expected to take advantage of Germany's liberal asylum law this year.

Although all major German parties have agreed to scrap the constitutional guarantee of asylum and replace it with a more restrictive law, they remain at odds over how to do it. Some opposition Social Democrats want Germany to replace the asylum system with immigration quotas, a goal rejected by Mr. Kohl's Christian Democrats.

Asylum-Seekers Put Austria in a Bind

By Craig R. Whitney
New York Times Service

VIENNA — The resplendent capital of an empire that collapsed three generations ago, Vienna since the end of communism in Eastern Europe is again a city in fear of being sucked into social and economic turbulence in its former imperial possessions.

For Chancellor Franz Vranitzky, now in his seventh year in office, the solution still lies in Austrian membership in the European Community, which now has 12 members.

But Europe shares many of his country's problems in coping with an influx of asylum-seekers and refugees from fighting in places like Sarajevo, where the demise of the Hapsburg Empire began 80 years ago.

"I believe Austrian entry is still a good idea," he said in an interview in his office across the street from the vast Hofburg Palace in the city center that was damaged by a fire on Friday.

Mr. Vranitzky, discussing Europe, said, "I'd like to hope that the process of European integration helps, and that individual countries aren't all left to their own national devices to cope with the problem."

The basic problem, he said, is "political instability and low living standards in one half of Europe, and higher living standards in the other half."

The effects of this division on Austria have been felt on a larger scale in Germany, where an estimated half a million asylum-seekers and half as many war refugees from the Balkans have streamed into the country and caused a rightist backlash.

So far, the Austrian backlash has included little of the neo-Nazi violence against foreigners that has afflicted its larger neighbor.

But Jewish cemeteries have been desecrated in Austria, as well, and a conservative politician named Jörg Haider has been making inroads.

Now Mr. Haider is pressing ahead with petitions for a national referendum on his 12-point program for ending foreign immigration and keeping the proportion of foreign children in public schools below 30 percent.

"We were the first to see this problem," said Mr. Haider, 42, the head of the Austrian Freedom Party.

His pressure has worked. In June 1992, the Austrian government put into effect a new law making it more difficult for East Europeans fleeing economic problems to get into the country as applicants for asylum and tightening the border controls with Hungary. The Hungarians also agreed to take back migrants rejected at the Austrian border.

In the first nine-and-a-half months of this year, only 15,155

asylum-seekers registered in Austria, compared with 27,000 in all of 1991. This year's figure includes nearly 4,500 refugees from the fighting in the Balkans, from which 39,961 more people have also sought and received temporary shelter in Austria.

On Nov. 17, the Austrians temporarily admitted 175 other Muslim war refugees from Bosnia after the British government refused to accept them, despite pleas from a British charity organization that had arranged their escape.

For Mr. Haider, whose party nearly doubled its share of the national vote, to 16.6 percent, in the last general elections two years ago, the government's measures have not been enough.

There are an estimated 325,000 officially tolerated foreign "guest

workers" in this country of 7.6 million people, but the government estimates that 100,000 more may be staying here illegally.

Mr. Haider says the real number of illegals is twice as high. "Austrians don't want to feel like strangers in their own country," he said. According to a recent Gallup Poll that showed that 76 percent of the people of the country opposed letting in any more foreigners, many Austrians seem to agree with him.

The chancellor said the refugee problem was far beyond Austria's ability to solve alone. But he hoped that Austria's application for membership in the European Community would be acted upon soon after Jan. 1, even though the precondition that the EC had originally insisted on before starting negotia-

tions — ratification of the 1991 treaty on European political and economic union — will not be satisfied because of delays by Denmark and Britain.

Dismissing Mr. Haider as a "populist," Mr. Vranitzky, who is 55, spoke diplomatically about the damage done to Austria's image abroad by the six-year presidency of Kurt Waldheim, the former United Nations secretary-general who concealed details of his past as a German officer in the Balkans in World War II.

Mr. Waldheim's term ran out last spring, when Thomas Klestil was elected to replace him. "With the countries that took exception to him, rightly or wrongly, the situation can only improve," Mr. Vranitzky said.

ISRAEL: Agonizing Over a Response to Neo-Nazism

(Continued from page 1)

many Audi and Mercedes cars on the streets and Braun coffee makers in homes.

Israelis routinely do business in Germany and go there for tours and study. Their government dealt with the then-divided Germans almost from the founding of Israel in 1948. It had formal relations with West Germany beginning in 1965.

After the United States, Germany is Israel's most important trading partner, with exports and imports last year totaling \$2.8 billion.

Still, for just about everyone, business stops at the Nazis' door. And nervousness about recent events turned to revulsion for many this weekend when Israel Television broadcast a German television

report that juxtaposed shots of Nazi-saluting modern youths with scenes of Auschwitz.

"We at last understood that this is not a fringe occurrence but something demonic that is happening in Germany," wrote Yosef Lapid, a columnist for the newspaper *Ma'ariv*.

Moshe Katsav, a leader of the opposition Likud party, said Israel should sever diplomatic relations if the Nazi revival is not squelched. At the cabinet meeting, Health Minister Haim Ramon argued that Israel should at least bring its ambassador home from Bonn for consultations as a form of protest.

On the radio Israelis heard the German ambassador to their country, Otto von der Gablentz, caution

against boycotts and other attempts to "isolate Germany," no matter how understandable their sensitivity may be.

"I do understand emotional reactions," the ambassador said. But he added: "Isolation helps those who do not want to have an open society, who do not want to have a democracy."

And perhaps inevitably, as with so many issues in Israel, this one had an echo in the Palestinian conflict.

Speaking with reporters in Gaza on Saturday, Haidar Abdal-Shafi, head of the Palestinian delegation to the Middle East peace talks, said that although neo-Nazism should be eliminated, he felt Israel was using it to create world sympathy for itself.

PARIS: Planning a Revival for the Champs-Elysées

(Continued from page 1)

pose the so-called golden triangle, with the Champs-Elysées as its pinchbeck third side.

Mr. Cazeneuve says that when he asked Jacques Chirac, the mayor of Paris, to make a program to revive the Champs-Elysées, Mr. Chirac was sympathetic, but had earmarked funds for the desolate east of Paris rather than its wealthier west. "I said the Champs-Elysées is neither east nor west but the center — a place that means something to the memory of the entire world," Mr. Cazeneuve says.

Its meaning may be mostly symbolic. The historian Louis Chevalier wrote in 1961 that the Champs-Elysées never was a center. "This triumphal way leads away from the center," he said. "It is too long, too wide, too straight. And it slopes uphill."

To some, the new program is

simply a cosmetic coating intended to prop up real estate values. Like the Christmas lighting paid for each year by local merchants.

When the Mission has transformed the Champs-Elysées from the Rond Point to the Ecole, Mr. Cazeneuve says, there will be 3.5 more hectares (about 8.6 acres) of pedestrian space. Although he dreams of elegant promenades and new grand hotels and fine restaurants, he says his group's goal is critical and not commercial. "We have a lot of ideas," he said. "The Botero exhibit is an example of what can be done."

The open-air show of 31 monumental bronzes by the Colombian artist Fernando Botero, between Concorde and Rond Point, has been attracting enormous weekend crowds.

Mr. Botero's dealer, Didier Imbert, said that Mr. Chirac's deputy

for environmental affairs had told him, "If you can get me Botero, we can get you the Champs-Elysées."

Mr. Botero, whom Mr. Imbert praises for his intelligent commercial sense, was willing, and the city paid for the installation, lighting and guards. Mr. Imbert says he forked out 10 million francs (about \$1.85 million) from his own pocket, which he should recoup in publicity and sales of T-shirts, posters, postcards and pins. "Not many people can afford a Botero, but anyone can buy a postcard," he says.

Mr. Imbert thinks the outdoor show will improve what Mr. Chirac has called the tarnished image of the Champs-Elysées. Certainly it has brought happy throngs as well as a few of the people the Mission hopes to eliminate. Already someone has stolen a standing figure's cane and the whiskers off the Botero cat.

4 Held in Madrid Slaying

Hundreds of people attended an anti-racism rally Sunday in a Madrid suburb, a day after the police arrested four youths in connection with the death of a Moroccan immigrant attacked in the suburb earlier this month. The Associated Press reported from Madrid.

It was the second killing of an immigrant in Spain this month and sparked fears of a rise in racism throughout the country.

News reports said the police arrested four youths Saturday in connection with the death of Hassan Yahahaqui, who died nine days after he was attacked Nov. 14 in the suburb of Majadahonda.

Residents of the suburb who witnessed the attack said four youths repeatedly beat Mr. Yahahaqui after pushing him to the pavement. He died nine days later in a hospital.

The arrests followed those Friday of a member of the Civil Guard and three minors for the fatal shooting Nov. 13 of Lucrecia Pérez, an immigrant from the Dominican Republic.

The guardsman and three minors implicated in Miss Pérez's death were questioned Sunday by an investigating judge to establish whether they acted in conjunction with some extreme rightist group.

Miss Pérez's death triggered a series of demonstrations against racism and xenophobia.

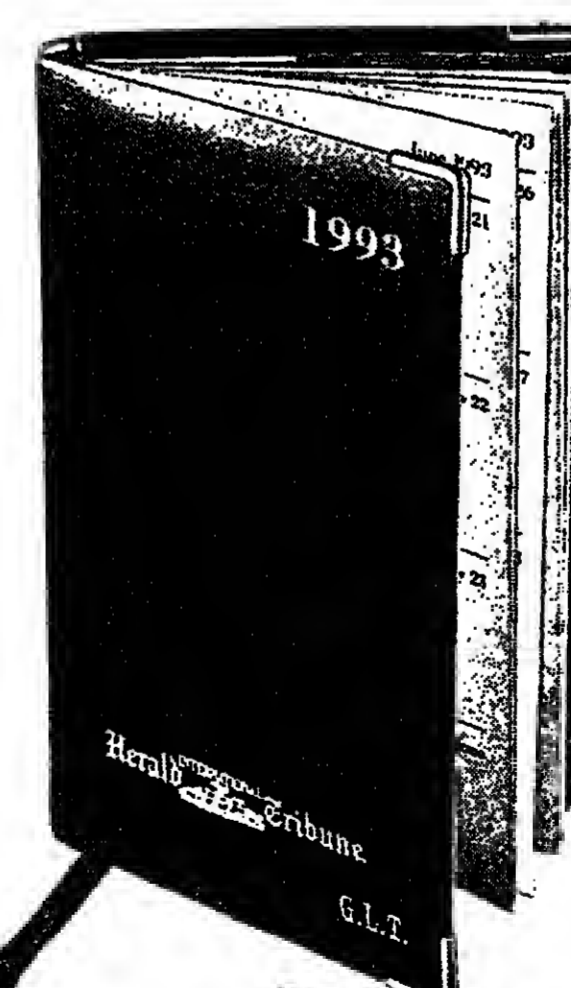
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ALBA

A New Industrial Power Base In Bahrain

Quality and Quantity: A New Era for Aluminum

Aluminium Bahrain (ALBA) has now completed a major smelter-expansion project, which will provide an additional annual production capacity of 235,000 metric tons. A new 800-megawatt power station has also been built.

The ALBA smelter now has some of the latest high-tech, automated-process systems in the world for making aluminum. ALBA metal will be sold to Asia and Europe as well as to the Middle East.

The completion of the \$1.5 billion expansion to the ALBA smelter marks the dawn of a new era of industrialization for Bahrain, one of the smallest states in the Gulf. With an overall production capacity of 460,000 metric tons a year of high-grade metal, ALBA now is one of the largest and most environmentally friendly smelters in the world. The expansion has included the upgrading of existing facilities and the construction of an entirely new, one-kilometer-long (0.62-mile-long) potline, containing 288 reduction cells ("pots"), in which the metal is made.

ALBA uses the latest French Aluminium Pechiney technology for producing the aluminum from Australian alumina oxide and special know-how from Norway's Asea Brown Boveri Flakt Norsk Vitefabrik to protect the environment.

Power for the electrolysis process to make the metal is obtained from an additional 800-megawatt, combined-cycle power station costing nearly \$500 million. The new power station uses almost unlimited natural gas from Bahrain's Khuff Field as a primary energy source. Waste heat generated by the gas turbines in the power station is used to produce steam, which drives steam turbines. Surplus power will be fed into Bahrain's national grid-distribution system (see related article, page 11).

Special attention has been paid to making the smelter as environmentally safe as possible for both the 2,300 workers in the plant itself and the outside atmosphere. More than \$180 million has been spent on treating fume emissions from the aluminum-making process — one of the largest environmental contracts ever awarded in the industry (see related story, page 10).

The construction work on the ALBA expansion project has had a major impact on the local economy and human resources, and it will continue to do so as new downstream ventures using aluminum as a primary metal come

into operation. At the peak period, more than 5,000 persons were working on the site.

ALBA has undergone a continuous period of expansion since its beginning in 1971, when it had only two potlines and a 360-megawatt power station. Production that year was a mere 10,000 metric tons. During the next 10 years, it increased to 170,000 metric tons per year with the addition of a third potline. By 1990, production and power output rose still further, and new technology was introduced, boosting metal output to 205,000 metric tons per year.

Anticipating a window of opportunity in world aluminum markets during the mid- to late 1990s, the government decided to go ahead with its most ambitious plan for ALBA — to double production to 460,000 metric tons per year and increase total power-generation capacity to 1,340 megawatts. The government also wanted to make Bahrain a "pole of attraction" by providing more primary metal for downstream export industries.

"ALBA has had its fingerprint on the economy of the island, especially during the last two years, in spite of the Gulf crisis," says Habib A. Kassim, minister of commerce and agriculture and deputy chairman of ALBA. "It has kept our economic motivation going, and it was a timely decision to go ahead. Bankers have told me that if it had not been for ALBA, it would have been very bad for them as well as for other Bahraini business executives. Here, we are all part of ALBA."

The foundation stone for the new potline was laid on March 6, 1990 — four months before Iraq invaded Kuwait — by Sheikh Khalifa bin Salman Al Khalifa, the prime minister, who unveiled a specially made sculpture in aluminum. The \$650 million loan facility for part of the financing was signed only two weeks before Kuwait was occupied — but the project never faltered.

Just after the war to liberate Kuwait began in January 1991, Yousuf A. Al-Shirawi, minister of development and industry and chairman of ALBA, visited the site one evening. Describing the scene, he says: "It was amazing,

People were still working although ALBA was regarded as a prime target for Saddam Hussein's Scud missiles. I found no fear there among the workers who remained — some Europeans left, but the Americans stayed on. We had enough skill and ability to carry on the work, and not a day was lost."

Gudvin K. Tofte, ALBA's chief executive, never even considered stopping the project. Mr. Tofte, a Norwegian who has been instrumental in developing the smelter

The smelter expansion cost \$1.5 billion and marks a new era of industrialization

since he came to Bahrain 20 years ago, admits that keeping the expansion work going was a close thing at times because of cash-flow difficulties.

"We had to go around with big smiles on our faces just to keep the contractors happy," says Mr. Tofte. "We had to spend a lot of time shopping around the Bahrain banks for bridging finance until the first drawdown of funds from the loan took place early in 1991, after the liberation

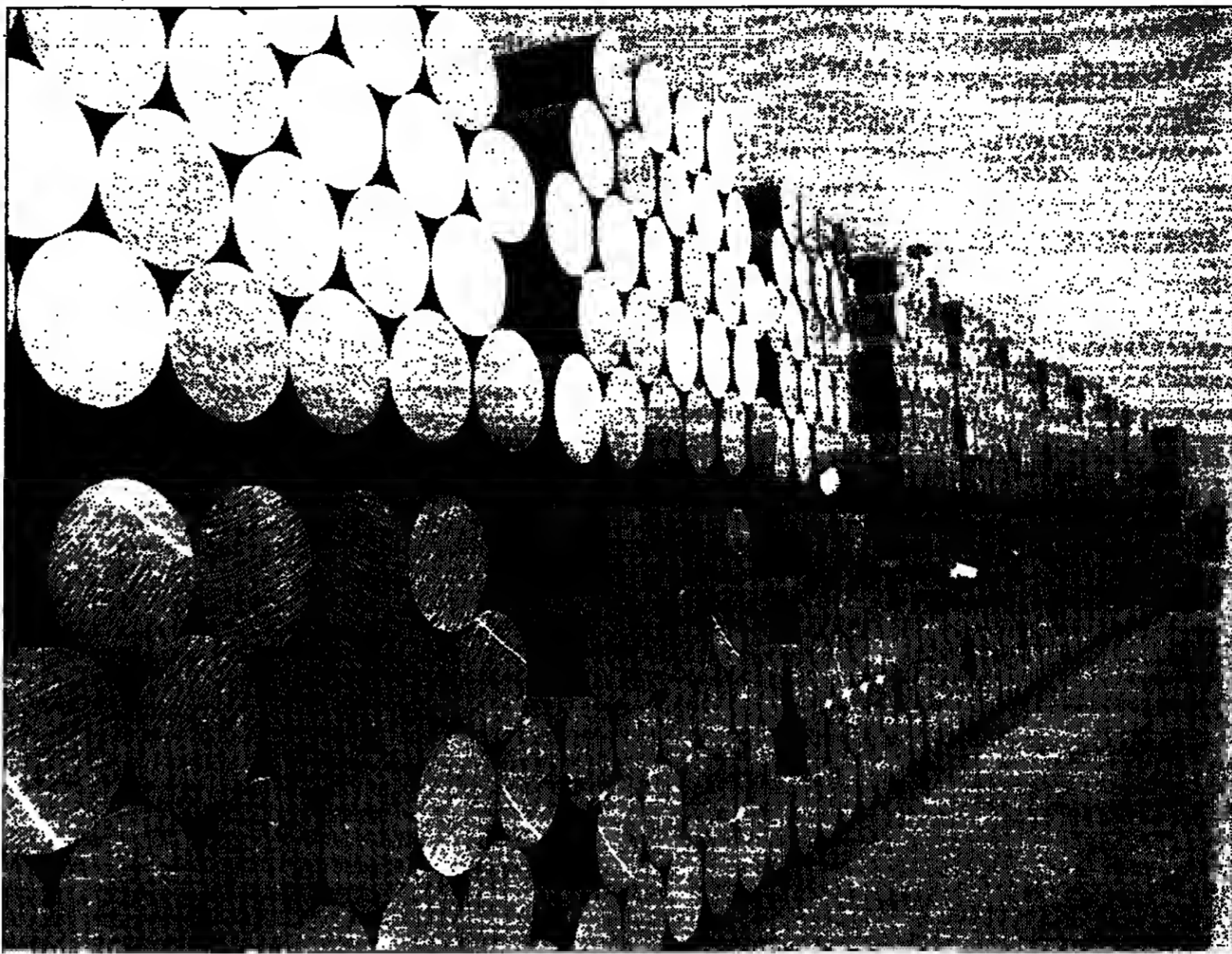
of Kuwait. That moment did not come a day too soon — we had used up all our money."

Abdulla H. Saif, governor of the Bahrain Monetary Agency, adds that the fact that the international financiers and backers of the project did not waiver reflected the confidence that they all had in Bahrain as an institution. "That was most important for us," says the governor. "We have never had the slightest problem in obtaining extended credit for ALBA."

The only interruptions were for the delivery of some items of equipment because ports in Bahrain and the Gulf were declared a war zone. Apart from shipping delays, insurance rates became prohibitive. The expansion program and power-station construction meant a massive logistics exercise for the contractors, with the transportation of materials and equipment — and the transfer of technology — coming from more than 20 countries as far apart as the southern tip of New Zealand and the northern regions of Norway.

More than 26,000 metric tons of steel were brought in

Continued on Page 18



Aluminum extrusion billets stacked and waiting for delivery. Aluminum is also produced as standard ingots, rolling slabs and T-ingots.

A Look at That Extra 'i'

Aluminum or aluminium? In the United States, the word is "aluminum." Across the Atlantic, it becomes "aluminium." There is an extra "i," and the accent shifts from the second syllable to the third. Why? The word was conceived in 1812 by the English scientist Sir Humphrey Davy, who pioneered the isolation of the element. He related it to "alum," a mineral salt that had been used since ancient times in tanning, dyeing and medicine. Davy first tried "aluminum" as a name for the new metal, then moved to "aluminium." The extra "i" came about 20 years later, inserted by wordsmiths who wished to give the word a more "classical sound" and to make it harmonize with "sodium," "potassium," "magnesium" and others.

The decisive supporter for the new spelling on the European side of the Atlantic was a French scientist, Henri-Etienne Sainte-Claire Deville, who in 1854 came up with a practical way to produce the metal chemically. He was also responsible for naming aluminum ore "bauxite," after Les Baux, near Arles, France, where quantities of the oxide were found.

The extra "i" failed to conquer America, where the word remains "aluminum." In this section, the word "aluminium" is used only in proper nouns or in quotes. Ken Mackenzie

Table of Contents

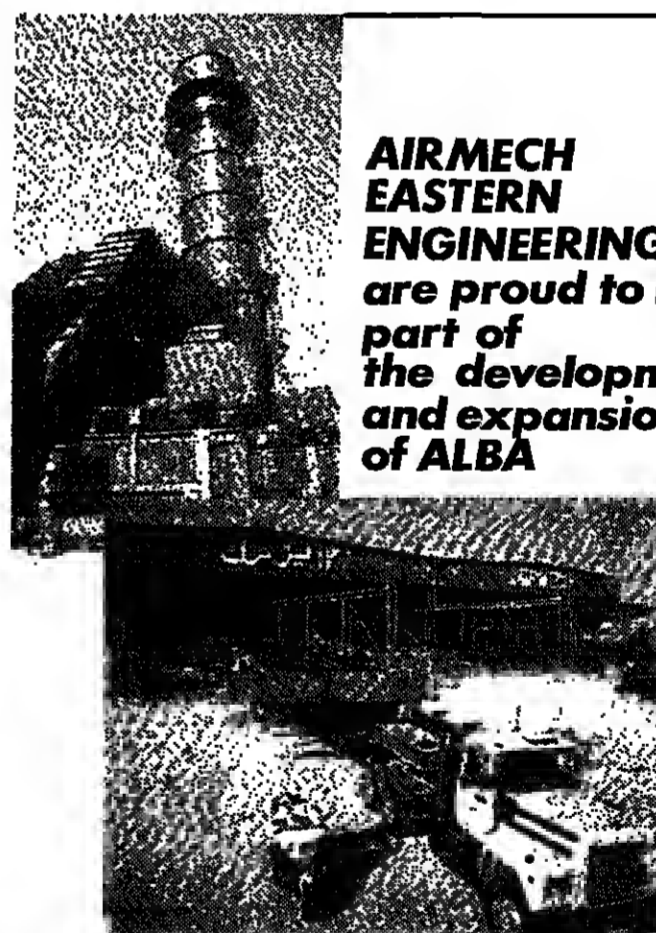
- Page 7
Aluminium Bahrain: A Dramatic Expansion Project.
Aluminum or Aluminium? That Extra "i."
- Page 8
Downstream Industries: Adding Value to Aluminum.
Transporting Materials: The Logistics of a Nonstop Operation.
- Page 9
Making Aluminum: A Powerful Lightweight.
Household Uses: Where Would We Be Without It?
- Page 10
Potline No. 4: Nothing But the Best.
Environment: Recycling the Resource.
French Railways: Aluminum Adds Speed to New TGV.
Techmo Car: "Smart" for Comfort and Safety.
- Page 11
New Power Station: A \$225-Million Deal.
Cars: Taking the Light Road.
- Page 14
A Multipurpose Chairman: Yousuf A. Al Shirawi.
Man for the People: Chief Executive Gudvin K. Tofte.
How It Began: The White Elephant That Wasn't.
- Page 15
Recruitment and Training: Tapping the Brain Bank.
Moving Up the Ranks: Profile of an-ALBA Employee.
- Page 16
Marketing: Balco Lends Muscle to Sales.
Global Outlook for Aluminum: Gulf Takes Center Stage.
Aircraft: The Lightweight Takes Off.
- Page 17
Plant Builders: More than 400 Companies Involved in Expansion.
Local Contractors: \$350 Million Worth of Business.
Recycling Aluminum: Easy, Cheap and Profitable.
- Page 18
Financing the Expansion: An International Effort.
Insurance: Arg Covers Bahrain's Largest Risk.
Promotions Office: Targeting Foreign Investors.
Design: From Clothing to Dinnerware.



Ahmed Ghuloom, pot-room superintendent, joined ALBA as a laborer when it began in 1971 (See page 15).

This advertising section was produced in its entirety by the supplements division of the International Herald Tribune's advertising department. • Heidi Ellison, a free-lance journalist based in Paris, writes for a number of publications. • Michael Frenchman is a free-lance writer based in London who specializes in the Middle East. • Paul Millbank, based in London, is the editor of Metal Bulletin Monthly. • Ken Mackenzie is a Paris-based journalist. • Pamela Ann Smith, based in London, writes often about Middle East topics.

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A major contract in ALBA for Airmech has been the Fume Collection Sub-contract for the Mechanical and Electrical Installations.

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Adding Value To Aluminum

There is more to aluminum in Bahrain than just the smelting process. Since the pouring of the first ingot by the Emir, Sheikh Isa Bin Salman Al Khalifa, in May 1971, a whole new downstream industry has been created — the largest of its kind in the Gulf.

"We have the money, the labor, the raw material and the power. We must make the best use of these," says Ahmed Al Khajah, a prominent Bahraini businessman and chairman of Al Khajah Establishment and Factories.

A typical Bahraini trading group with diversified interests, including contracting and many agency representations, Al Khajah Establishment and Factories has also been involved in an electrical works contract: ALBA worth 600,000 Bahraini dinars (\$226,000). The group is about to start up a new factory to make cathodic protection devices (transformer/rectifiers) for the oil, gas, petrochemical and water industries; the devices help prevent corrosion to pipes and storage tanks. The group will use aluminum from the smelter as a primary raw material. The new factory will be the first of its kind in the

New auto-wheel factories in the works

Middle East. It represents a step forward in high-tech industrial manufacture for the island, as do two new auto-wheel factories. One will start production shortly; plans for the second are still being finalized. Another development is the recent formation of Gulf Aluminium Industries (Gaiico), which will build a new production unit at the Bahrain Aluminium Extrusion Co.'s plant.

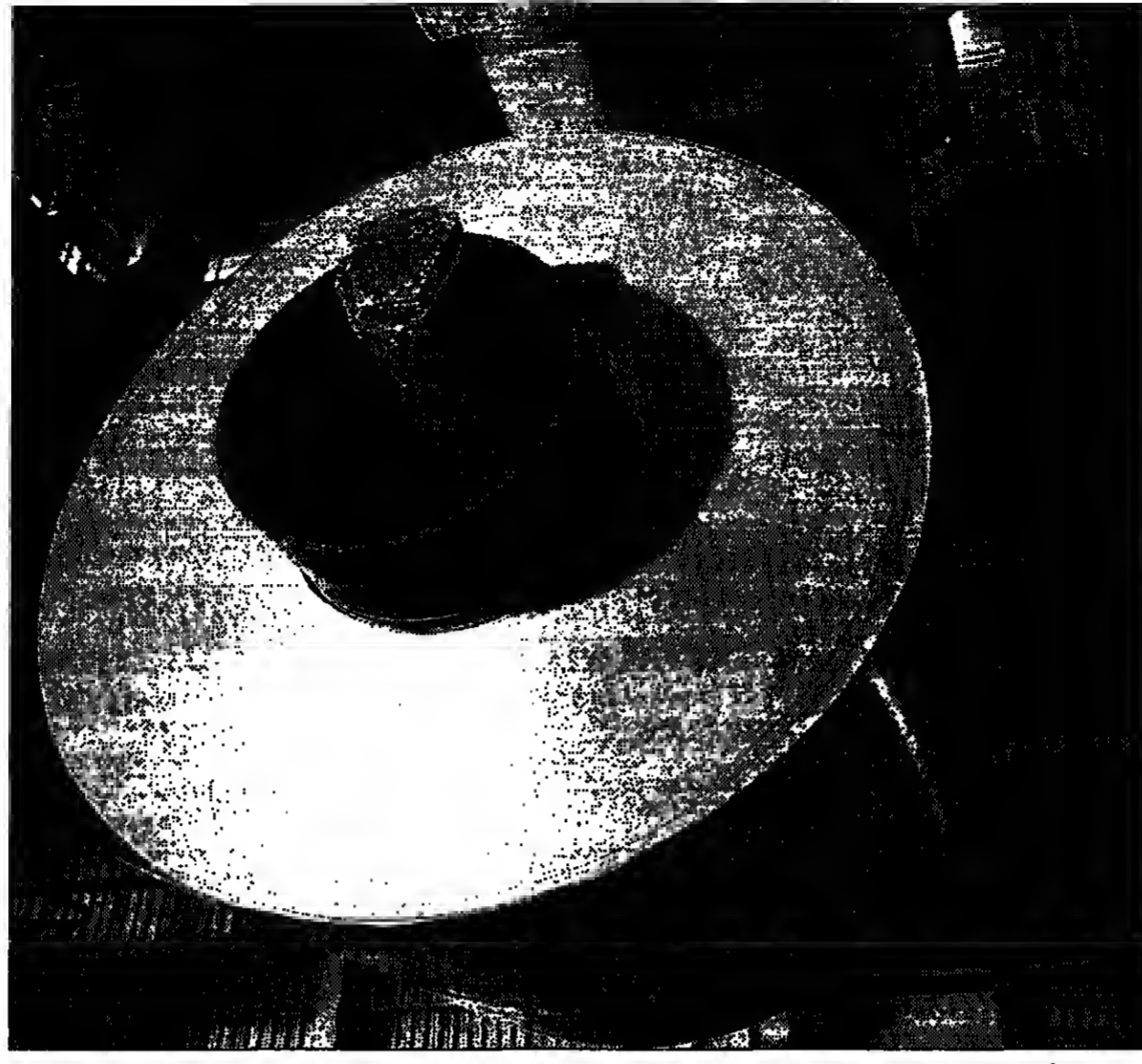
The downstream industry has now become one of the backbones of the local economy and a vital factor in the island's industrial diversification away from an economy based on finite hydrocarbon reserves (its oil will run out in about 30 years).

The latest venture, in conjunction with a German company, is an auto- and truck-wheel factory, which will manufacture lightweight wheel castings for export to Europe — a major step forward for Bahrain's industrial diversification. A second joint-venture auto-wheel plant is likely to go ahead with a South Korean company.

One of the first downstream industrial ventures to be set up was Midal Cables in 1977. It manufactures about 50,000 metric tons a year of aluminum rod, overhead conductors and cables for the power industry. When new supplies of aluminum are available from ALBA, production is expected to expand to 90,000 metric tons a year. It has now started a joint-venture factory — Alurwheel — with the German company BBS Kraftfahrzeugtechnik of Schiltach to make wheel castings. Al Zayani Investments, which owns 51 percent of Midal Cables, is also the major shareholder in Alurwheel.

Khalid Rashid Al Zayani, one of the island's leading entrepreneurs and chairman of both the investment group and Midal Cables, has an eye on future developments.

"One of the things we have been looking at for Midal is making aluminum tubing for use mainly in car radiators," says Mr. Al Zayani. "We are already trying to market the tubes to manufacturers in France, Germany and even Japan." He is also looking at other possibilities



This coil of sheet was hot-rolled from a 10-ton slab ingot by the Gulf Aluminium Rolling Mill Company (GARMCO) in Bahrain, one of the many downstream industries in the country.

for using aluminum-based components for the auto industry; these include pistons and cylinder heads.

The new Alurwheel factory, located alongside the cable factory adjacent to the smelter, will be producing half-a-million wheel castings a year starting this December. "Our eventual target will be 1.5 million a year when we go into full production," says Mr. Al Zayani. The plant, which will have nearly 70 Bahraini workers, will use about 5,000 metric tons of aluminum in the first year.

"We are going to produce a really good-quality wheel at a very competitive price," he says. "We are not going to let the price element affect the quality." One of the first customers will be Germany's BMW factory. According to Mr. Al Zayani, his German partner BBS is planning to move part of its research-and-development unit to Bahrain. "This will give us a new engineering technological advantage for the future," he says.

Bahrain scored another first for the aluminum industry in the Gulf with the formation of the Bahrain Aluminium Extrusion Co., which is 100-percent government-owned. Balexco began production in March 1977 following a feasibility study and cooperation agreement for seven years with Alusuisse. Its first customer was a local company, Al Zamil Aluminium.

The factory was originally built with a designed capacity

of 2,700 metric tons a year and an anodizing capacity of 2,200 metric tons. The latter is now done by one of the Al Zamil factories. Balexco was expanded in 1980 and again in 1983, giving it a capacity of 6,000 metric tons a year of extrusions. In 1980, it also obtained a license to produce the Technal range of products, which enables the smallest factory to manufacture highly sophisticated, architectural structured extrusions using simple kit-form tools. Today, the factory makes a wide range of products, including flagpoles, lighting columns, goal posts for football and handball, bus-stop shelters, telephone booths, doors, windows and balustrades. "Now we are looking at expanding again and diversifying our product range," says Ali M. Al-Abbasi, Balexco's technical manager. One project still at the planning stage is a joint venture with an Italian group, which would use some 15,000 metric tons of aluminum billets a year.

Balexco is also looking at a joint venture with a Korean group to establish an auto-wheel plant. Balexco would have a 15-percent share, and the factory would use up to 30,000 metric tons of aluminum a year. The wheel plant would create up to 100 new jobs, in addition to the existing 270 at Balexco's extrusion plant. If the extrusion plant were expanded, another 40 workers would be needed. At present, 84 percent of the labor force is

Bahraini. A powder-coating factory is also under review, and another project to manufacture aluminum handles and fittings for doors and windows is being studied.

The first downstream industry was being planned even before the ALBA plant was completed in 1971. This was Bahrain Atomisers International, one of the few companies in the world manufacturing atomized aluminum powder. BAI started production in May 1973. It was originally a joint venture with Johnson and Bloy Holdings of Britain and Eckart Werke of Germany, through their shareholding in the smelter with Breton Investments; the latter is now the only other shareholder apart from the Bahrain government, which holds 51 percent of the company. BAI had an original design capacity of 3,000 metric tons a year, which was increased to 6,000 metric tons in 1980.

BAI takes the molten aluminum straight from the nearby smelter. The aluminum is driven to the plant in a special refractory-lined crucible. Upon arrival, the crucible is pressurized and the molten metal blown out through a special nozzle. Powder is formed by using a special combination of temperature, pressure and nozzle size. When the powder is cooled, it is packed for export in either steel drums or "jumbo" polyethylene bags containing up to 1,000 kilos (2,200 pounds) of atomized powder. It is widely used in manufacturing paint, ink, fabrics, expanded concrete, petrochemicals and steel and as a component for rocket-propulsion fuels.

The most significant downstream development was the opening of the \$100 million Gulf Aluminium Rolling Mill Co. in 1986. Garmco was another first for the Gulf. It was a joint venture with Iraq and six of the seven states

Downstream industry underpins economy

of the Gulf Cooperation Council (Bahrain, Kuwait, Qatar, Oman, United Arab Emirates and Saudi Arabia). The initial plan was to supply the shareholders with up to 40,000 metric tons a year of rolled aluminum sheet. The first year's production of 22,000 metric tons exceeded all expectations, and further expansion took place.

"We are now producing some 65,000 metric tons a year," says General Manager John Paterson. "Originally, we were selling our products to Europe and North America. Now the target area is the Middle East. We see a big growth market in the can industry, which is rapidly expanding. Some 50,000 metric tons go from Garmco for can ends, bodies and tabs." Mr. Paterson would like to see more capital investment in the plant to meet higher specifications for the can industry, which requires thinner rolled sheets. This means installing new rolling mills that would squeeze ALBA's 10-ton rolling ingots down to sheeting 0.2-millimeter (0.008-inch) thick and as little as 0.15-millimeter thick for the lithographic industry.

Costs have been reduced significantly over the past two years, and annual output per worker is now approximately 132 metric tons. This year has seen several record production runs from the mill. In May, average weekly production was 1,300 metric tons; in June, it rose to 1,572 metric tons. A standard coil of foil is 7,000 meters (23,100 feet) long and weighs 5.2 metric tons.

Mr. Paterson believes the time has come for Garmco to reposition itself in the marketplace and take advantage of increasing demand by the canning industry in the region. A proposed Coca-Cola plant in Bahrain would require 75 million cans a year, representing almost 70 percent of Garmco's current production.

With the various expansion plans and new downstream manufactured products coming onstream, the question raised by some businessmen is whether or not ALBA's massive expansion program will have to be further extended in the future to meet quality-demand at home and abroad.

M.F.

Night and Day, Nonstop Transport of Materials

Every 24 minutes night and day, a 40-ton heavy truck rumbles the 11 kilometers (6.8 miles) along the causeway road from the marine terminal to the plant. Its load? Alumina oxide, the basic raw material from which aluminum is made. Alumina oxide is shipped from Alcoa's bauxite mines in Western Australia to the terminal,

which has been constructed on an artificial island. Before the plant expansion, the alumina oxide was off-loaded from the ships and carried to the plant by an overhead bucket ropeway. This will now carry petroleum coke (another ingredient for the aluminum-manufacturing process), which is also delivered by sea, and alumina oxide only in an emergency. A new road links the terminal with the mainland so that a continuous supply of alumina oxide can be transported nonstop 365 days of the year. If supplies of alumina oxide are interrupted for any length of time, or the electrical power fails, smelting comes to a halt.

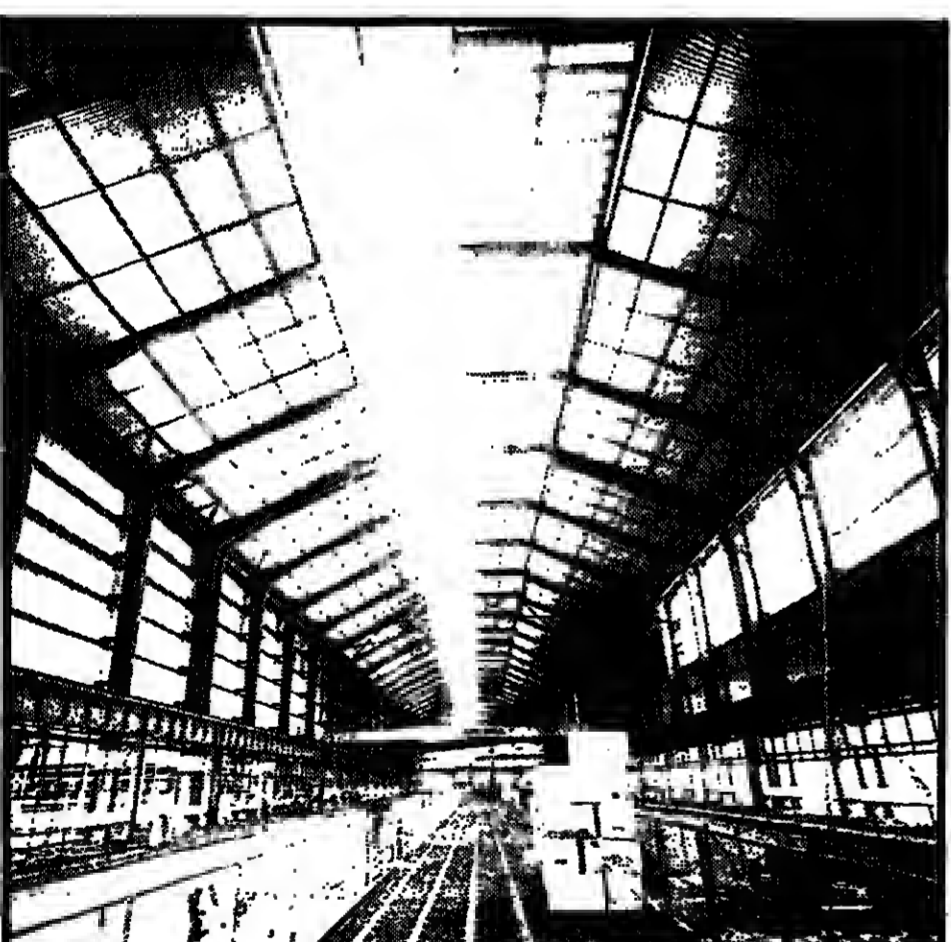
The alumina is carried in five trucks, which run the regular shuttle service; two smaller vehicles are used as standbys or for distributing some of the alumina within the plant area. The shuttle-run involves moving 2,400 metric tons a day. Special storage and delivery silos with ancillary handling equipment for the alumina have been constructed or improved to convey the massive quantities of the material required for the smelting operation.

"Because of the volume and the number of different delivery points, the handling system has been a complex operation," says Klaus W. Lehmann of Klockner Industries-Anlagen. The company was responsible for constructing

the various material-handling systems for the alumina, petroleum coke, pitch, cryolite and fluorside. Some of the materials, apart from the alumina and coke, are shipped to Mina Sulman, Bahrain's main port, and taken by road to the plant.

The work involved modifying the alumina-loading system at the terminal, constructing a 2,500-ton silo for emergency supplies of alumina and building two 12,500 storage silos for the new potline. Alumina is fed to the pots by a special conveyor.

The materials for the smelting operation come from all over the world in huge quantities to manufacture 460,000 metric tons of aluminum a year. M.F.

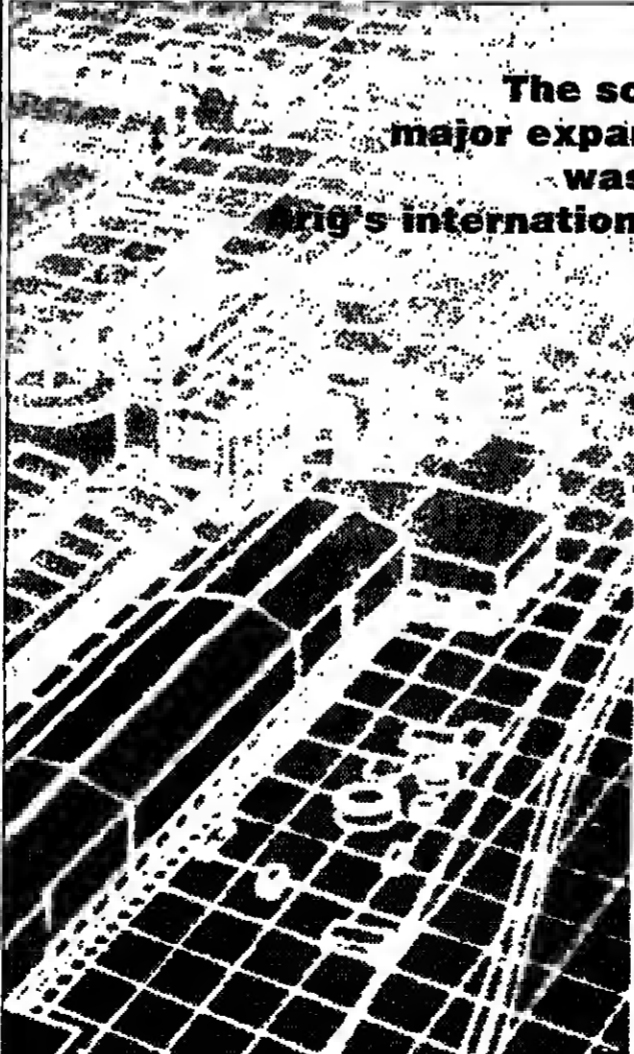


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The scale of Alba's major expansion project was matched by ARIG's international expertise.

Aluminium Bahrain (Alba) is one of the world's major aluminum reduction plants. The recently completed US\$ 1.44 billion expansion project has boosted the smelter's annual production capacity from 225,000 tonnes to 460,000 tonnes. In addition, Alba's power generating capacity has increased from 540 MW to 1340 MW.

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A Lightweight Metal Is Heavy on Power

Aluminum's ore-to-metals equation has a pleasing simplicity. Four metric tons of bauxite, the basic raw material from which aluminum is derived, yields two metric tons of alumina, the intermediate product in the chain, which in turn produces one metric ton of primary aluminum out of the smelter gate.

Several other ingredients are needed along the way, but the overriding requirement in aluminum production is energy; most of this is consumed as electricity at the smelting stage, during which alumina is converted to metal.

Just how energy-intensive aluminum production is, can best be seen by comparing its need for energy with those of other everyday materi-

Aluminum's overriding requirement is energy

als. Aluminum production requires about 20 times the energy needed for cement manufacture, 10 times that used in glass production and roughly double the energy input required for copper.

Modern smelters such as ALBA consume 12,000-14,000 kilowatt-hours per metric ton of metal produced; energy is used earlier on in the production chain as well, bringing the total requirement to 17,000-19,000 kwh/metric ton, depending on the age and efficiency of the equipment at each stage and the quality of the materials being processed.

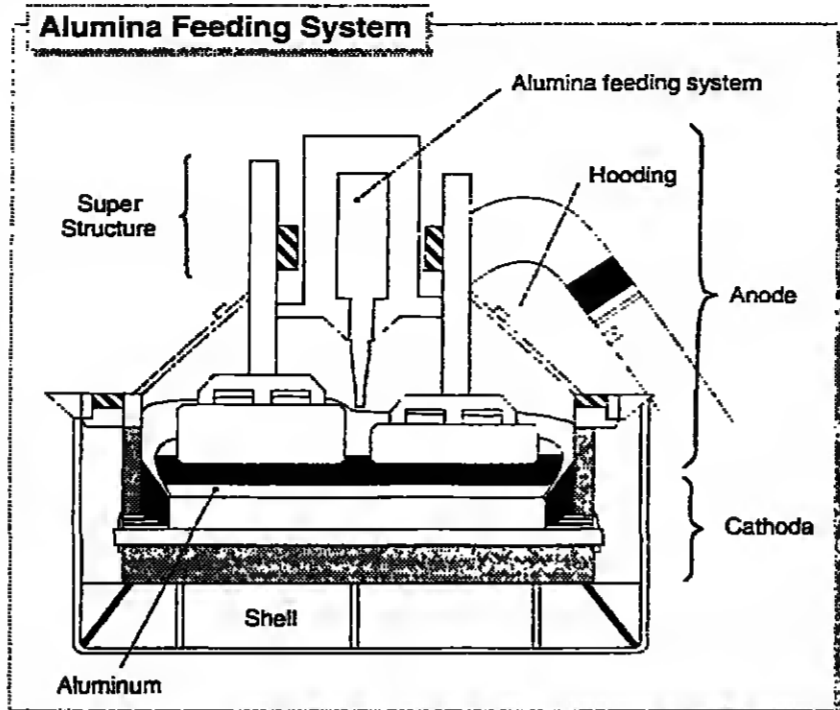
The bauxite used by the aluminum industry contains 45 percent to 60 percent aluminum oxide, along with iron oxide, silicon oxide, titanium oxide and water. Although deposits exist in a large number of tropical and subtropical countries, most of the mining activity is confined to a handful of places where large, easy-to-mine deposits exist. Notable producers are Australia, Guinea in West Africa, Jamaica and Brazil. Once out of the ground, the bauxite is crushed, dried and transported to an alumina refinery.

Alumina refineries, which typically have capacities of 800,000 metric tons or more per year, are either sited in the same region as the bauxite deposits or thousands of miles away, closer to the smelters that buy the product. An example of the first scenario is Australia, where significant alumina production capacity now exists on the back of the world's

largest source of bauxite, while the United States is perhaps the best example of the latter.

The design of an aluminum smelter and the preferences of its operator very often lead to the choice of a particular source of alumina produced from a specific bauxite deposit, and this does not necessarily mean sourcing from the nearest available alumina plant. ALBA's alumina, for example, is shipped from Western Australia, and the overriding consideration is consistency; a smelter manager is not interested in ever-changing sources for his raw materials.

The conversion of bauxite to alumina is usually via the Bayer process: The bauxite is mixed with liquid caustic soda and then pumped into pressure vessels, where it is subjected to high temperatures and pressures. This is followed by settlement, filtration, precipitation and then calcination in rotary kilns before alumina



na (Al₂O₃) emerges as a fine white powder ready for shipment to the smelter. Although alumina is the principal raw material for a smelter, others — including coke, coal tar pitch and cryolite — are needed.

Aluminum is produced in electrolytic cells or "pots," which have carbon anodes and cathodes and an electrolyte in which the alumina is dissolved. The cells are long, rectangular, shallow steel containers measuring up to 10 meters x 3 meters x 1.5 meters (33 feet x 11 feet x 6 feet); these are lined with refractory bricks and carbon blocks produced by baking a mixture of metallurgical grade coke and coal tar pitch. They have multiple anodes (rectangular blocks made from a baked, compressed mixture of petroleum coke and coal tar pitch) suspended in the

electrolyte from above the cell. Alumina is dissolved in the electrolyte (a mixture of cryolite — a fluoride of sodium and aluminum — and aluminum fluoride held at a temperature approaching 1,000 degrees C. or 1,832 degrees F).

The carbon anodes are usually produced on site; the so-called "pre-bake" anodes are preferred to Söderberg anodes, which are baked while in the cell, largely because higher environmental standards can be achieved, but also because they offer better power performance.

In the little over 100 years in which aluminum has been produced commercially, the electrical-current rating of these pots has increased steadily; today, such recognized leaders as France's Pechiney use cells with a rating close to 300,000A.

Since only a small voltage is required per cell, large numbers of pots can be connected in series, the cathode of one pot coupled electrically to the anode of the next. ALBA's new potline, for example, has 288 cells and stretches for a distance of almost one kilometer (0.62 mile).

Within each cell, the electric current flowing from anode to cathode through the electrolyte reduces the alumina to aluminum metal (which settles to the bottom of the cell) and oxygen (which burns off carbon on the anodes). About 0.5 kilogram (1 pound) of carbon is consumed for every kilogram of metal produced.

As smelter design has advanced, so the energy required to convert alumina to aluminum has decreased.

Today, smelters operating at 12,500-13,500 kwh/metric ton of metal are at the leading edge of the technology. ALBA's new potline is designed to operate with an energy consumption of 13,200 kwh/metric ton — a very similar figure to that for several other new smelters or expansions around the world, for which Pechiney's technology is proving the most popular choice.

Potlines and thus smelters have grown in size over the years with individual lines commonly in excess of 200,000 metric-tons-per-year capacity. Since it is not unusual for smelters to grow in stages, plants well in excess of 400,000 tpy are becoming less rare, and ALBA's 235,000-tpy expansion will raise its total smelter capacity to about 460,000 tpy.

Because of the significant energy needs, primary aluminum production has increasingly gravitated toward regions of low energy cost rather than where the metal is most needed. Japan, for example, now has negligible smelting capacity. This usually means that plants are built in areas of abundant hydroelectric power, where oil or gas is cheap.

The Gulf is an example of the availability of oil-based energy making smelting attractive. Captive sources of such fuel make gas- or oil-fired power stations economic.

Although much time is devoted to reducing the power consumption of aluminum smelters, with a lot of attention being paid to such factors as magnetic balance and the application of computerized process control and automation systems to optimize operating parameters, overall plant design has advanced to the point where manning levels today are a fraction of what they once were. The day-to-day supervision of hundreds of pots, for example, can be done by a handful of operators using overhead cranes.

The standard commodity shapes are cast by pouring the molten metal into individual molds, but rolling ingot and extrusion billet are continuously cast through a shallow mold with a retracting base, which chills and solidifies the metal as it goes through and can produce large ingots or multiple billets with one cast.

It is in the meltshop's holding furnace that the composition of the metal can be adjusted to produce whichever alloys are required for a particular cast. Aluminum alloys are designated by a 4-digit notation. For example, aluminum-copper alloys are grouped in the 2000 series, manganese-containing alloys in the 3000 series and magnesium-silicon alloys in the 6000 series.

part of our surroundings from falling apart.

Aluminum also protects us from the elements — in the form of aluminum hydroxide, it is used to waterproof fabrics.

We all know that most of the beverage cans we sip our favorite soft drinks from are made of aluminum, but what about the humble bottle cap that has been sealing in the bubbles since the turn of the century?

Now aren't you ashamed of not paying more attention to aluminum all these years?

What's left to "aluminumize"? Maybe our award system. Olympic medals are gold, silver and bronze; anniversaries are silver, golden and diamond; best-selling records are gold and platinum... What accomplishment is worth an aluminum prize? All suggestions welcome.

Paul Millbank

A Home Without Aluminum? Don't Even Consider It

Have you ever stopped to wonder what your home life would be like without aluminum? Of course not. You just take it for granted.

If there were no aluminum foil, you would have to wrap all leftovers in that other sticky, clingy food wrap. And how could you bake potatoes and holiday turkeys?

What would keep the cold chill of winter out if not for aluminum window and door frames? The very roof over your head may be covered with heat-reflecting aluminum coating, and the lightning rod that may one day save your life is made of aluminum. And how do you get up to the roof? On a lightweight aluminum ladder, of course. And where would the world's couch potatoes be if that aluminum antenna up there were not bringing in the television signal?

What would American suburbs look like without aluminum siding?

How would their residents lounge around in the backyard without aluminum-frame lawn furniture? Don't forget the aluminum chain-link fence that keeps the dog from running away or the explosive aluminum powder that sets off your holiday fireworks. And what if there were no aluminum chlorohydrate in your personal antiperspirant... well, let's not think about the consequences.

Speaking of personal hygiene, you probably aren't aware that the only reason your toothpaste squeezes out so easily is because the tube is made of aluminum.

Your bicycle and lawnmower would be a lot heavier to lug up from the basement every spring if it were not for their lightweight aluminum components. And wouldn't you be embarrassed if your kid wanted to be the next Hank Aaron and you couldn't afford a wooden bat? Luckily, less-expensive aluminum bats

are now available and are even being used by U.S. college teams.

Let's talk about cooking. You might starve without your aluminum pots and pans. Tea time wouldn't be the same without the aluminum tea kettle, one of the earliest uses of cast aluminum. By the way, if you own any cast or hammered aluminum cookware made in the 1930s, '40s or '50s, it may be valuable. Many of these handsome and nearly indestructible items are now collector's items. Perhaps we should hold on to those aluminum trays that frozen foods come in. Who knows?

Aluminum helps us to keep things together. Have you ever wondered why the staple in a tea bag doesn't rust? Because it is made of aluminum. And why those little twist ties used to close plastic bags are so easy to bend? Because they have an aluminum wire inside. Aluminum nails, screws and bolts keep a good

part of our surroundings from falling apart.

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Heldil Ellison

What's left to "aluminumize"? Maybe our award system. Olympic medals are gold, silver and bronze; anniversaries are silver, golden and diamond; best-selling records are gold and platinum... What accomplishment is worth an aluminum prize? All suggestions welcome.

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New Potline No. 4: Nothing But the Best

The government took a bold step in doubling ALBA's output to 460,000 metric tons a year in one dramatic expansion project.

ALBA's expansion project involved building the new No. 4 potline, which uses the latest Aluminium Pechiney technology in the reduction process to turn alumina oxide into metal. The management consultant for the project was Bechtel Ltd. Total production capacity from the new potline is 235,000 metric tons per year, which will have a significant effect on productivity. Twenty years ago, annual production per employee was only 43 metric tons; now it has reached approximately 250 metric tons. The new potline, which is one kilometer (0.62 mile) long, is probably the most modern and largest in the world. It has 288 "pots," or reduction cells, in addition to the existing 684 cells in potlines 1, 2 and 3, which are all being modernized under an extensive retrofit program due to be completed next year.

ALBA began its smelting operations in 1971 with just two potlines and a 360-megawatt power station. Production in the first year totaled 10,788 metric tons. In 1981, production went up to 170,000 metric tons per year with the addition of the No. 3 potline and increased electrical power-generating capacity. The first 76 of the new generation point-feed reduction cells were started up in 1990, increasing production levels to 205,000 metric tons. In the same year, the government approved a program to retrofit 446 old cells in lines No. 1 and 2.

The expansion project also includes upgrading the existing cast house and building another one (the cast house is where the molten metal is poured into molds and turned into ingots, billets or slabs), as well as another carbon plant for making the anodes used in the reduction process. A new power station has also been constructed.

The retrofit program, which began in 1991, starts with potlines No. 1 and 2, then potline No. 3. The program involves applying advanced technology to extract, treat and recycle gas from the old-style pots and to control radiant heat. This is achieved by installing special hoods over the pots, point feeders for the addition of alumina, fume ducts and gas-cleaning systems. Many process-control systems will now be automatic. These measures alone will increase production from the No. 1 and 2 potrooms by 20,000 metric tons per year and reduce manpower by about 15 percent.

The existing cast house was doubled in size primarily to take advantage of the demand for billets and ingots, or slabs, for rolling products. In 1991, major contracts were awarded for the purchase and installation of new melting and holding furnaces with a capacity of 35 metric tons, a billet saw and two homogenizing furnaces, a cooler and direct-chill casting equipment. Production of billets and rolling ingots reached 120,000 metric tons per year and 140,000 metric tons per year by the middle of this year.

A second cast house for standard ingots and alloys was built to handle the extra output from the new potline. After the liquid metal has been brought to the cast house, it is poured into special mixing furnaces to which are added small amounts of silicon, magnesium, copper,

iron, titanium or boron. These ingredients help to ensure that the metal reaches particular alloy specifications. After they have been added, the metal is cast in either solid ingot molds or through special direct-chill casting machines, which have a water-cooled jacket. As the hot metal comes into contact with the cool sides of the mold, it "freezes" into the special shape required. The three ingot casters in one of the cast houses are dedicated to standard ingot production. Each has a throughput of 20 metric tons of ingots per hour. Each ingot weighs 22 kilograms (48 pounds) and is stacked in a special interlocking bundle, which is strapped and stored for shipment. Each bundle weighs one metric ton. The casting machines in the other cast house are used to produce extrusion billets, rolling ingots and T-ingots.

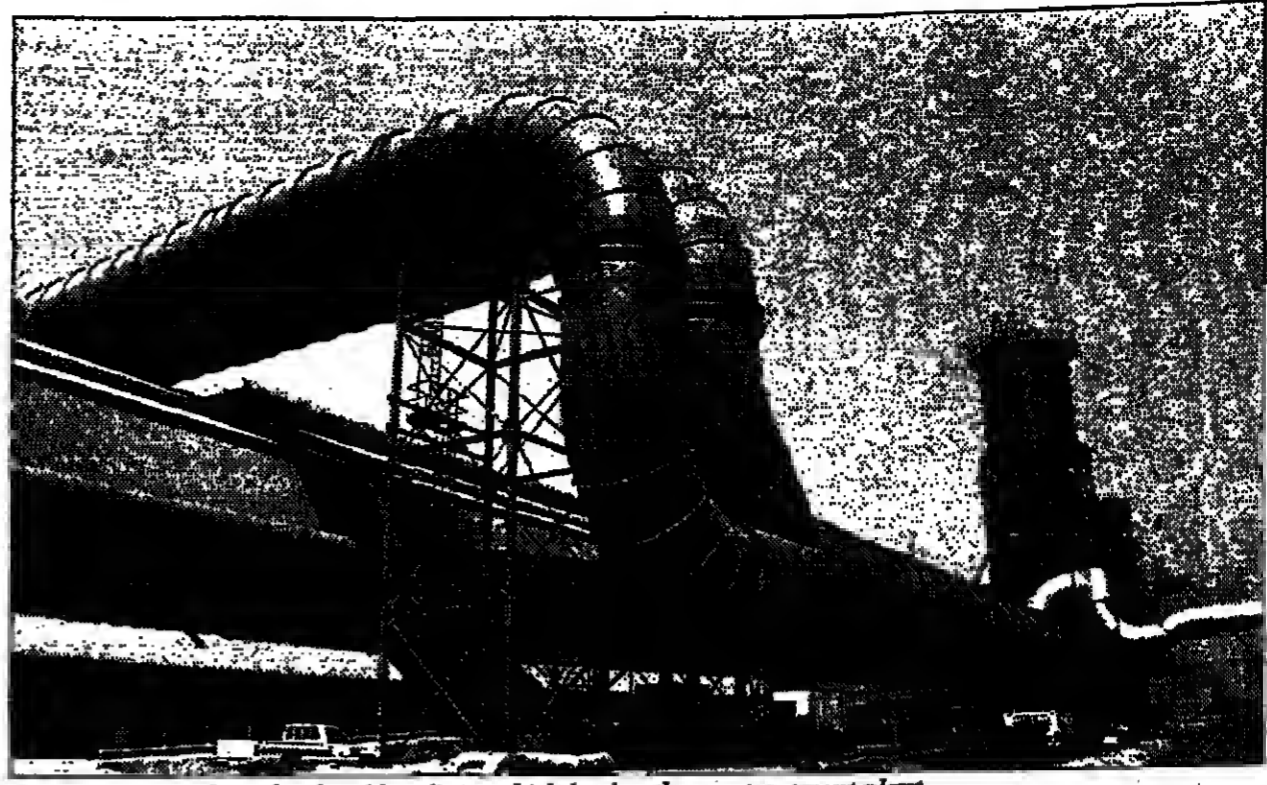
Apart from casting ingots and billets, about 55,000 metric tons of hot liquid metal are transported in special crucibles direct from the potlines. This goes straight to two of Bahrain's existing downstream manufacturing operations — Midal Cables and Bahrain Atomisers — located adjacent to the ALBA plant. Hot metal will also be supplied to the new BBS auto-wheel factory, located nearby, and another wheel plant is expected.

Carbon is used for making the anode blocks, which are suspended on the end of aluminum rods with a steel base above each cell. They are partly immersed in molten cryolite, to which the alumina is added via the point feeders. The carbon-lined cell acts as a negative cathode, while the suspended anodes are positive. Massive electrical current passes between the anode and the cathode, causing an electrolysis process to take place, reducing the alumina, which is dissolved in the electrolyte to neutral aluminum; this is collected at the cathode of the cell.

Each metric ton of aluminum consumes 415 kilograms of carbon anodes. One anode lasts about 28 days before it is burned away. A total of 240,000 metric tons of anodes are made each year in the two anode production plants. These comprise a paste plant, baking kilns and a rodding shop. The anodes are made from petroleum coke, which is mixed with coal tar pitch into a paste and formed into "green" anodes. These are then baked in kilns at a temperature of 1250 degrees Centigrade (2282 degrees Fahrenheit) for 17 days. During the baking, the coal tar pitch evaporates, leaving behind a heat-resistant, electrically conductive carbon block.

Potline No. 4 is the most modern of its kind yet built and is the leading edge of Aluminium Pechiney's reduction technology. Microprocessors monitor and computers control all stages of the manufacturing process. Real-time data analysis gives immediate warning of the slightest problem. Routine processes like changing the anodes, breaking open the crust on top of the molten metal in the pots and tapping off the newly made aluminum are all controlled from the comfort of a fully computerized, air-conditioned cabin.

M.F.



Fume-extractor ducts for the old potlines, which lead to the gas-treatment plant.

Recycling the Resource That Went Astray

Energy conservation and environmental protection have been top priorities for the ALBA expansion project, one of the cleanest in the world.

Pollution should be regarded as a "resource that has gone astray," says Gudvin K. Toft, ALBA's chief executive, who has taken a strong personal interest in making sure that ALBA is now one of the

waste gases from the gas turbines are led through waste-heat boilers, which produce steam to drive two steam turbines. The gas from the reduction cells in the potlines and the anode-baking kilns is cleaned by "dry scrubbing" units in a massive, closed-fume-control and fluoride-recovery system called the fume-treatment plant.

One of the safest smelters ever built

"most environmentally friendly and cleanest" smelter operations in the world. "Taking care of the environment brings direct cost savings to the compa-

"This is the biggest system we have ever supplied and probably the largest in the world," says Kjell Hagen, president of ABB Flakt Norsk Vitefabrik of Norway, which won the \$88 million contract. "ALBA now has an environmental control solution that is the best available."

During the aluminum-reduction process, the most dangerous emission is the presence of fluorides in the reduction cells, or "pots," where alumina oxide — the raw material for the production of aluminum — is reduced to molten aluminum. Fluorine is an element of the electrolyte in which the reduction of the alumina takes place.

A small part of the fluoride contained in the electrolyte evaporates and reaches the fume-treatment plant in a gaseous form. If it were untreated and released into the atmosphere, it could be harmful to vegetation but less so to livestock or human beings. The technology for the fume-treatment plant, which was pioneered by ABB Flakt more than 20 years ago, ensures that the minimum of harmful emissions takes place.

At the new potline No. 4, huge fans ("flakt" is Norwegian for fan), connected to a duct big enough to drive a small bus through, suck out the gas containing the fluoride and dust particles from the pots. The alumina is injected into the gas from the reduction cells. The fluoride gas sticks to the alumina grains. The gaseous mixture is then drawn into the dry scrubbers, which are part of the fume-treatment plant. The gas passes through polyester-felt-bag filters, which are shaken by an air stream. The

fluorine-loaded alumina grains, which are then returned to the reduction process. This means that no waste is produced, and the fluoride is returned to the cells at a rate of 1,500 kilograms (3,300 pounds) an hour, representing significant savings. Only clean "gas" goes into the atmosphere. The scale of the operation is immense. Almost one million cubic meters (35 million cubic feet) of gas can be cleaned in one hour. Mr. Hagen believes that the payback period for the treatment plant will be only five years.

"ALBA now produces the cleanest air in the world from the No. 4 potline," says Mr. Hagen. In addition to the No. 4 potline-treatment plant, two retrofit fume extractors and dry-scrubbing units have been fitted to the older potlines, which are being updated with new technology.

Apart from fume extraction and reprocessing the fluorides, environmental working conditions inside the pot rooms have also been greatly improved. Today, working conditions are completely changed, and ALBA has one of the safest and cleanest smelters ever constructed.

The whole process is computer-controlled, and sophisticated alarm signals warn pot-room staff of any impending problems. The operators can control almost all the aluminum-making reduction process in the No. 4 potline from special air-conditioned cabins. They no longer have to endure high noise levels and excessive radiant heat, and they are protected from the dangers of splashing hot metal. Stressful and arduous tasks have been virtually eliminated.

"It is not like it used to be when we had to work in temperatures that often exceeded 50 degrees centigrade [122 degrees Fahrenheit] alongside open pots," says Ahmed Ghulloom, who began work in the first pot room more than 20 years ago. Today, he is superintendent of pot room No. 4.

M.F.

'Smart' for Comfort and Safety

"Engineers on wheels" is how one might best describe the slightly unusual know-how provided by the Italian group, Techno Car of Limena, Padua. Techno has been providing intelligent mechanical power for the primary aluminum industry for more than 30 years. It is also concentrating on engineering design to modernize out-of-date

processes and equipment in the aluminum smelting industry. Since ALBA first began back in 1971, it has supplied a total of 42 specially designed mobile trucks, or "cars," which perform difficult and potentially dangerous tasks in the pot rooms. These tasks cannot easily be done manually. They often involve handling very hot metal de-

vices used in the reduction process. These include changing the anodes and distributing the fluoride and cryolite, point feeders and crust breakers. The company has also provided the fume wall rig in the anode bake house as part of the expansion. "What we are trying to do," says a company director, "is to improve the op-

erator's working conditions and environment in the pot rooms by introducing semi-automatic vehicles and equipment with high comfort and safety standards." Techno believe that its know-how helps to reduce power consumption and increase the overall efficiency of both new and old pot-room operations.

M.F.



The new TGV: lighter and faster.

Trains Lose Weight And Gain Speed

Aluminum plays a vital part in the new generation of double-deck high-speed trains now being tested in France. The third-generation TGV, or train à grande vitesse, is the result of a research program costing 450 million francs (\$83 million) undertaken by the French railways, Société Nationale des Chemins de Fer Français (commonly known as SNCF). In collaboration with GEC Alsthom, it is planned that the new high-speed trains will be carrying passengers by 1999. The new TGV will run at 350 kilometers (217

miles) an hour, which is 50 kilometers an hour faster than the TGV Atlantique. It will have a redesigned power unit, delivering 50 percent more power, and a new braking system. But the crucial difference is the extensive use of aluminum (and some composites) to replace the steel used in earlier versions of the TGV. This means that the weight of 17 tons is brought down to 16 tons, though there are now two decks and 40 percent more passengers. As well as providing strength with lightness, the use of aluminum will save money on maintenance.

K.M.

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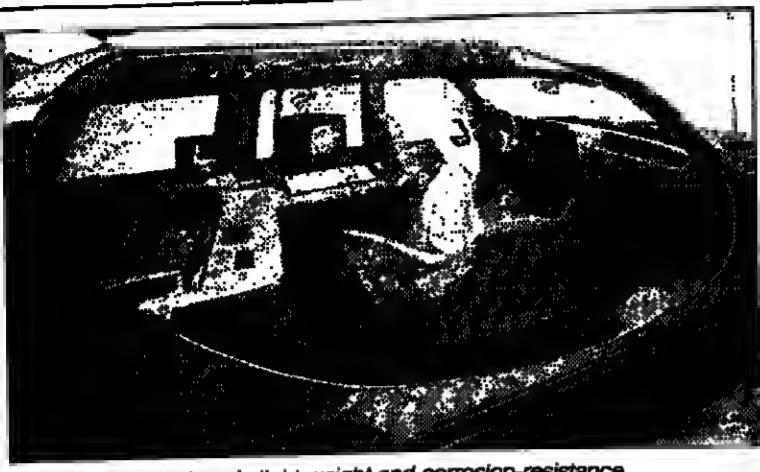
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ADVERTISING SECTION



Auto assets: aluminum's light weight and corrosion-resistance.

Cars Take the Light Road

The average American car contains at present about 176 pounds (79.8 kilograms) of aluminum, according to Ford. The company estimates that this will increase to 500 pounds by the year 2003.

The "magic metal" (as National Geographic Magazine called it) faces some competition in the automobile industry from plastics, ceramics and composites and has always been a rival of steel. But it is winning.

A large vote of confidence came in October 1992, when the Aluminum Company of America (Alcoa) announced that it was to spend \$70 million in building a first-of-its-kind plant in Soest, Germany to produce aluminum components for automobile "spaceframes."

The spaceframe concept has been under development for seven years and is just coming to fruition. The first customer for the Soest plant spaceframe components will be Audi, but Alcoa hopes the plant will have customers from other manufacturers.

General Motors plans to produce cars based on aluminum spaceframes at a rate of 10,000 a year from 1993. Ford has shown a "concept" sports car called the Contour, which is based on a spaceframe technology developed by Reynolds Metal. Japanese manufacturers are also committed to using more aluminum: Honda's NSX sports car is the most aluminum-intensive on the road, containing 1,000 pounds of the metal.

The spaceframe concept is a significant departure from traditional methods. As Alcoa explains it, instead of spot welding as many as 300 stamped-steel components to form the car's structure, fewer than 100 aluminum extrusions and inter-

connecting aluminum-die-cast nodes are robotically welded to form the spaceframe structure. A limited number of aluminum sheet components, such as inner fenders and floor pans, are attached to complete the body.

Paul H. O'Neill, chairman of Alcoa, describes the spaceframe as "the single most significant program Alcoa has ever developed for, and with, the automotive industry." The benefits, he says, "go well beyond the expected attributes of aluminum, such as light weight and corrosion-resistance."

He adds that it helps set "new contemporary standards for manufacturing efficiency, performance and passenger comfort, while meeting the increasing social demands for safety, fuel efficiency and recyclability."

Recyclability is certainly a big advantage. In the United States, about 85 percent of all automotive aluminum scrap is recycled, and there are about 220 vehicle-shredders working in the United States.

The coming increase in use of aluminum will create challenges for the recycling industry: aluminum is difficult to separate from general scrap, whereas waving a magnet will bring out steel parts. Furthermore, aluminum panels are affected by paint and by long exposure to the atmosphere, making them difficult to handle.

These problems are not insoluble, however, and the huge advantage of aluminum is that it has a high scrap value, can be used again and offers no threat to the environment. In Germany, legislation is pending requiring automotive materials to be recyclable by the year 2000.

K.M.

Power, Spider Control And a \$525-Million Deal

The economic return on manufacturing aluminum by electrolysis hinges on making as much metal as possible with the minimum amount of electrical power.

The making of aluminum is a complex, 24-hour-a-day, 365-day-a-year operation that depends on a continuous supply of alumina (the basic raw material) and huge amounts of energy.

According to ABB Kraftwerke of Mannheim, about 13 kilowatt-hours of electricity are needed to produce one kilogram (2.2 pounds) of aluminum. If the power supply fails, the molten alumina will harden in the reduction cells, or "pots," after about four hours. The restart of a solidified potline is a difficult, lengthy and expensive process.

With the expansion of the smelting process and the doubling of production that resulted from the open-

use, producing another 60 megawatts.

The new power station will help provide a total of 1340 megawatts at an ambient temperature of 15 degrees centigrade (59 Fahrenheit). Its main purpose has been to provide energy for the new potline and to integrate energy supplies to the other three potlines. Any surplus energy, which might amount to as much as 250 megawatts, will be fed during periods with peak demand into the national grid by the summer of 1994 through a new 220-kilovolt link to the original Riffa Power Station.

Because of increasing power demands, there is likely to be a shortfall in supplies to the island's electricity network. By taking the extra power from ALBA, however, there is now no need for another power station to be built.

The new power station is the largest in the Gulf

The new potline No. 4, additional stable power supplies were needed. On June 13, 1990, a \$525 million contract to build a new 800-megawatt combined-cycle power station (No. 3) was awarded to a consortium headed by ABB Kraftwerke of Germany and ABB SAE Sadelmi of Italy, with Britain's Ewbank Preece as consulting engineers. More than 1,000 workers representing 60 nationalities have been involved in the project; about 10 percent were Bahrainis.

The power station, which recycles waste heat to produce more electricity, is the largest of its kind ever built in the Gulf. It represents a new step forward in the environmentally friendly generation of electricity. Exhaust gases and waste heat, previously emitted into the air from the six gas turbines, are used to produce steam, which then drives two steam-turbine generators.

ALBA's power-generating capability has gone through a continuous period of expansion since the smelter opened in 1971. At that time, it had 19 gas turbines producing only 360 megawatts; these are being replaced by the new station. Ten years later, another five gas turbines were added, increasing output by 120 megawatts; in 1990, a combined-cycle, retrofitted steam turbine was brought into

"ALBA has now become an integral and essential part of the Bahrain Electricity Directorate's network, which will also be able to meet any unexpected shortfall in power demand by ALBA," said Gudvin K. Toft, chief executive of ALBA, at the September signing of a \$70 million loan with 10 local and regional banks to finance the new link.

ABB Kraftwerke's man on the spot is Wolfgang Godau, the site and consortium manager. Originally from Heidelberg, Mr. Godau coordinates the activities of the four associated companies, three of which are from the ABB family. ABB's Mannheim plant in Germany has provided all the turbines, six waste-heat boilers and the entire electrical system with generators, transformers and switch gear.

The gas turbines are massive pieces of equipment weighing 178 metric tons each, and the generators, weighing 115 metric tons, are almost as large. It took about four weeks for the equipment to be shipped from Germany to Bahrain's Mina Sulman port. There, a floating crane lifted them off the ship onto special low-loaders for transportation by road to the ALBA site.

"Our biggest problem has been logistics," says Mr. Godau. "Nevertheless, we have built and installed nearly six complete gas turbines in



Gas turbine and waste-heat boiler stacks at the new power station.

12 months — no mean achievement."

The two steam-driven turbine generators will come into operation in January and April next year. One technical refinement is the closed feed-water circuit with air-cooled condensers. "About one million gallons of water a day are needed," says Brian Stone, of Ewe Bank Preece (EWP), who also stresses the importance of quality control on the project. "Every single nut and bolt has been inspected on this job at the stage-by-stage inspections. We have to anticipate trouble before it occurs."

The new power-generation system has been designed as two independent modules, each with its own state-of-the-art computerized control systems operating from a central control room. This so-called "Spider" control system from ABB Sweden also looks after the No. 1 and No. 2 power stations. A British company, Switchgear & Instrumentation, won a \$6.4 million order to supply low-voltage switchgear and distribution-control systems. Some of the equipment was made in stainless steel for the first time.

ABB SAE Sadelmi has provided the various transformers, gas-insulated switch gear, cooling condensers and water-treatment plant — a dou-

ble-reverse osmosis system. Antonio Craparotta, managing director of ABB SAE Sadelmi, notes the close collaboration between members of the consortium. "I hope this collaboration will continue to be as fruitful in the future," he says, "and that ABB SAE Sadelmi will continue to contribute its know-how in power generation and distribution and infrastructure projects in the Middle East."

Another member of the ABB family, ABB Process Automation, has provided the main power link from the generators to the actual aluminum-manufacturing process. Some of the transformer-rectifier units ("rectifiers") were at the leading edge of some very specialized technology. The units convert the 132-kilovolt power supply from alternating current to direct current with an output of 300,000 amperes, used to "drive" the electrolytic process in the reduction cells. The six rectifiers, which weigh 165 metric tons, contain a massive 72-ton electrical coil used to produce the ultra-high direct current. "It was the first time that this size of rectifier had ever been built in one piece, and we had a few teething troubles," says Günter Wiewel, ABB Process Automation's superintendent engineer. "But that's normal for something like this."

M.F.

5 Dimensions of Aluminium

b
BALCO

ب
balexco

MIDAL

GARMCO

BAI

Bahrain Saudi Aluminium Marketing Company (BALCO) - is responsible for marketing Bahrain and Saudi Government's combined 97% off take of primary aluminium from ALBA and Bahrain Government's 51% (3,000 per annum) Off take of atomised primary aluminium powder from Bahrain Atomisers International.

BALCO exports the products from ALBA and BAI to the Far East, South East Asia, The Indian Sub-Continent, the Middle East and Europe. BALCO in addition, supplies a sizable quantity for consumption by down stream industries in Bahrain.

In addition, BALCO purchases aluminium for resale and trades in international aluminium consuming markets.

Bahrain Aluminium Extrusion Company (BALEXCO) - established in 1977 and operating at a capacity of 6,000 tons per annum is one of the leading high quality extrusion suppliers in the Gulf.

Currently 20.73% of the Company is held by the private sector from the G.C.C. and the balance by the Bahrain Government.

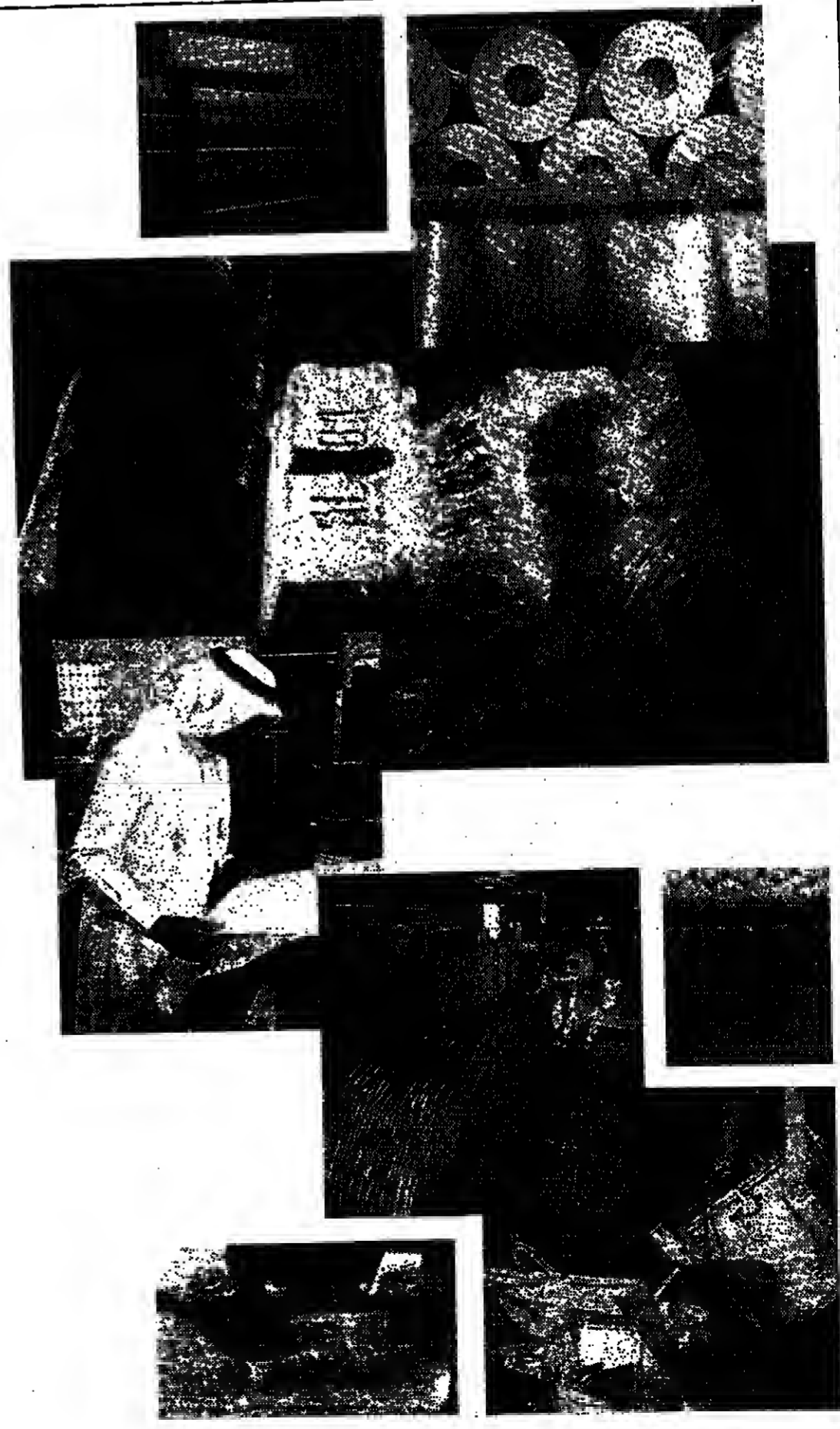
Extrusions are produced according to international standards and specifications for a range of applications and customer's own requirements.

Balexco is also a licensee for Technal-France and Aluisse aluminium systems.

Midal Cables - Since production commenced in 1978 Midal is one of the few companies in the world producing aluminium alloy rod and the first to do so in the Middle East. The company has also manufactured 75,000 tones of overhead conductor for export, to countries in Asia, Africa, the Middle East and the United States. Midal Cables produces and markets a comprehensive range of aluminium, aluminium alloy and steel reinforced bare overhead conductors and redraw rod. Midal also produces a wide range of conform products such as aluminium solid sector for power cables, aluminium strips for transformer winding and aluminium tubing for radiators, heat exchangers and condensers. In consultation with clients, Midal can formulate and supply products to any particular specification required.

Gulf Aluminium Rolling Mill Company (GARMCO) - the plant is one of the largest and most important ventures to be undertaken in the region. Consistent high quality production has enabled the company to market its products in most major markets of the world. Today, GARMCO products are exported to North America, Europe and Japan, in addition to servicing the needs of the Middle East/GCC countries. Although GARMCO is the youngest of Bahrain's downstream aluminium industries, its rapid growth in a relatively short period augurs well for the future.

Bahrain Atomisers International (BAI) - established in 1972 as the first downstream industry designed to utilise the metal produced by ALBA. Bahrain Atomisers International is one of the most prestigious companies in the world producing atomised aluminium powder for use in paints and explosives.



مكتبة البحرين

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ABB Kraftwerke AG. Supplying turnkey power plants is our business, and we love it - particularly when it is for a client like ALBA: a company that demands the highest standards. ALBA needed 800 MW of electric power. We supplied them with what is both the most advanced and the largest combined cycle power plant ever seen in the

Gulf area. We are proud that our skills and technology are accompanying ALBA on their way to the very top of the world's aluminium industry. *ABB Kraftwerke AG - ABB's power generation company in Germany.*

ABB Sae Sadelmi. Thanks to 70 years of experience in general contracting, we have learnt to tackle the issues associated with even the most complex projects such as the ALBA combined cycle power plant. We are delighted to have contributed to ALBA's expansion and success in the aluminium industry through our engineering and construction capabilities and total quality focus. 55,000 MW in steam, gas and combined cycle power plants installed all over the world are proof of our expertise in this field. *ABB Sae Sadelmi - Italian know-how and capabilities.*

ABB Process Automation. The unique nature of the aluminium production process demands the highest standards of performance and reliability. That is why ALBA chose ABB as the supplier for the crucial 300 kA/1300 V rectifier and auxiliary power front end for Potline 4. State-of-the-art technology and long experience: these are the keys to ABB's success, and have put ALBA at the leading edge of world aluminium production. We are proud to have been associated with ALBA's fine achievement. *ABB Process Automation AG - ABB's industrial process company.*

ABB Flakt Norway. ALBA has given environmental protection the highest priority. They demanded the most environmentally effective technology available. It was our pleasure and our challenge to meet these demands. Using know-how and experience gained over 40 years on more than 200 projects, we supplied cleaning plants that will treat seven million cubic meters of gas per hour with a cleaning efficiency close to 100%. Instead of being emitted as pollutants, 13,000 tons of fluorides, as well as valuable alumina, are recovered annually. *ABB Flakt Norway - Environmental Technology for Quality of Life.*

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Sailor and 'People Person' Is Smelter's Chief Executive

Gudvin K. Tofte is the Norwegian-born chief executive officer of ALBA. More comfortable in overalls than in a suit, he calls himself a "people person."

Mr. Tofte joined ALBA in August 1972. He came up from the shop floor, worked in the pot room — where the aluminum is made — and became production manager and eventually manager of the plant in 1976. He became general manager two years later. In 1983, he became CEO.

wrong specification, he was regarded as an upstart and told to keep his mouth shut by a colleague. That person turned out to be the plant manager who summoned the young Mr. Tofte to his office the next morning.

little aggressive. Perhaps so. I like to get straight to the point." He does not like bureaucracy or routine. He hates writing memoranda and reports, and even reading them sometimes is a trial.

"The support we got from the work force was absolutely marvelous"

home in overalls and more likely to be seen around the office in shirt sleeves. "I like to be comfortable and only put on a suit when I really have to," he says.

That has been very much the pattern of his professional life, even though joining ALBA was only his second job (his first was with an Alusuisse smelter in Norway).

The fact that he is prepared to roll up his sleeves and get out his tool box (metaphorically speaking these days because so much of the smelter is computerized) and go down to the pot room to solve a problem has won him enduring support from his work force.

He has always tried to create a good environment at ALBA for both working conditions and from the point of view of making it as pollution-free as possible. The environment is one of his favorite topics, even when it comes to boating, one of his main forms of relaxation.

"If you are working in an environment where people don't care what you are doing, the standard of work becomes lousy," he says. "The Bahrainis here are very responsive and positive toward increased responsibility themselves."

When Mr. Tofte, now aged 52 and a family man with three children, is not at ALBA keeping watch over the expansion, which is probably his biggest challenge, he is more than likely to be on his motor yacht — with his beeper and mobile phone.

A senior member of his staff says that Mr. Tofte is "the ultimate hands-on manager. He knows what's what, and he'll tell you exactly what to do." Bankers — for whom he will wear a suit, and there have been a lot of "suit" meetings recently to sort out ALBA's financing — are equally impressed by his managerial and negotiating skills.

Another was in 1976-80, when the labor force — 3,000 at the time — was reduced to increase productivity, and more Bahrainis were brought into the plant. Motivation was created by means of a profit-sharing scheme based on cost savings.

Mr. Tofte, the son of a baker from Halsuøy, a small island village in the west of Norway, admits he has been telling people what to do in the aluminum industry since he joined a smelter in his home country as a student trainee at the age of 20. Convinced there was a technical problem in the pot room because of a

ly concerned about its future economy. "We were all acutely conscious that there would be a day not too far away when our oil would run out — in about 50 years' time," recalls Yousuf Ahmed Al Shirawi, who was director of the oil bureau at the time; he is now minister of development and industry.

"In 1964, we were very concerned," he says. "We had one of the highest population growths in the



Gudvin K. Tofte, chief executive of ALBA: "The Bahrainis here are very responsive and positive."

Chairman Is Man for All Purposes

One of the most influential men in the development of the aluminum industry in Bahrain is Yousuf Ahmed Al Shirawi, the minister of development and industry and chairman of Aluminium Bahrain (ALBA).



Yousuf Ahmed Al Shirawi, minister of development and industry: "We had to have a quality product from the word 'go!'"

Mr. Shirawi has been closely involved with every stage of ALBA's current expansion project. His involvement goes back to the smelter's earliest days in the 1960s, when he was secretary to the island's Administrative Council.

out environmental safeguards and generally assist them with all aspects of planning their new venture. He is convinced that there has to be a new attitude toward industrial and commercial development. He has a vision of the future in which all services and industries harmonize and develop together.

He calls himself a "multipurpose man," an apt description for this bluff, no-nonsense Bahraini whose role is to take industrial development by the back of the neck and drag Bahrain into the 21st century. Since the beginning, he has always regarded ALBA as the catalyst for greater industrial diversification on the island. His critics likened it to a "white elephant" scheme, but this was not to be the case. ALBA's production and sales soared from 10,000 metric tons a year to 460,000 metric tons annually.

"The advanced world of the next century will be a new order in the industrial world, which will bring together all the services — insurance, maintenance and travel — under one umbrella," he says.

"We have had a quality project from the word 'go' — from the start of production to the last aluminum ingot. Our government has never wavered from trying to achieve this ideal," says Mr. Shirawi. "We are now able to produce some of the cheapest and best ingots in the world. This is going to be a big boost for the island's economy, which will initially benefit from an additional income of more than \$80 million a year."

A new service industry that is growing in importance for Bahrain is maintenance, which is becoming a new technology, according to Mr. Shirawi. He says many companies in the Gulf are now paying the price for not taking into account the effects of the environment — salinity and humidity, which lead to corrosion — on construction work during the 1970s.

He hopes the government will be able to reinvest part of this revenue as capital expenditure to create new downstream industries. "We would really like to see more semimanufactured products so as to increase the added value of our products from ALBA," says Mr. Shirawi, adding that there are several projects either at the acceptance or engineering stage. He believes that a number of oev projects will start up in the next three or four years, which will also create a number of new jobs.

"We're not even maintaining our bodies properly," he says with a touch of humor in his voice. Mr. Shirawi is a demonstrative speaker who does not like to waste time as he darts from one subject to another — the price of aluminum, the Kuwait crisis, Bahrain's future and even his daughter's wedding. The subject he keeps returning to, however, is ALBA. M.L.F.

25 Years: No Trace of a White Elephant

On May 24, 1967, one of the first telex machines installed in Bahrain began tapping away. It was sending a message from the Caltex oil company for Yousuf Ahmed Al Shirawi, director of Bahrain's oil bureau, telling him that an investment group was on its way to the island to discuss building a smelter.

The investment group arrived for talks with the government two weeks later, on the day the Arab-Israeli war started. It was also the beginning of the Aluminium Bahrain smelter (ALBA).

region at the time. We began to look at various schemes to improve our economic climate — import substitution, maintenance services for the oil industry and so on. We knew we had huge gas reserves, which then had no value at all. Associated gas was just flared off in the rest of the Arab world. We played around with ideas for fertilizer and petrochemical plants — anything that might use gas as a natural energy source or as a raw material."

from Bahrain Petroleum Company (Bapco) called Denis Jones. Bapco was then owned by Caltex, the Canadian-registered oil company, and it offered to help explore new ideas.

aluminum industry who were looking for cheap energy sources. Eventually, that particular contact was passed on to me," says Mr. Shirawi, who remembers only too well the next development.

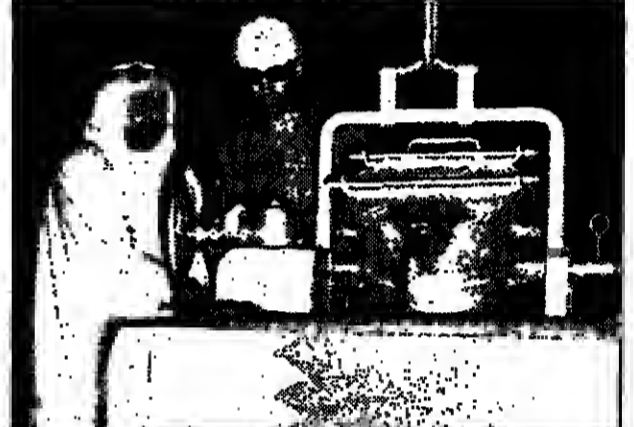
The war started, but investors came

ly concerned about its future economy. "We were all acutely conscious that there would be a day not too far away when our oil would run out — in about 50 years' time," recalls Yousuf Ahmed Al Shirawi, who was director of the oil bureau at the time; he is now minister of development and industry.

It was decided to form a development bureau, which Mr. Shirawi headed; he worked with a teacher, a driver and a messenger. "The teacher was in fact Habib Ahmed Kassim (now minister of commerce and agriculture), and we reported to the finance director, Sayed Mahmood Al Alawi," says Mr. Shirawi, who also recruited a young engineer

to May 1967, Mr. Shirawi received a report from the "ideas team," advising against any involvement in fertilizers or petrochemicals because there were too many huge plants in Europe. Bahrain would be unable to compete with them. Bapco did suggest, however, that someone should go out and try to sell Bahrain as an investment opportunity. The man chosen for the job was a vice president and former navy submarine commander, Hugh Storey.

Then it happened. A message from Caltex clattered out over the telex machine informing Mr. Shirawi that the British Metal Corporation and a banker representing the investors' group would come to Bahrain on June 6.



His Highness the Emir of Bahrain, Sheikh Isa bin Salman Al Khalifa, pours ALBA's first production of aluminum in May 1971.

Shirawi. "There were demonstrations in the streets against the British — but the investors came. Four days later, we had a letter of intent from them to go ahead with a smelter project study."

board meeting, many of the participants got cold feet because of the political situation in the Gulf and the general upheaval taking place. "They wanted us to guarantee even keeping open the Strait of Hormuz — otherwise, they would withdraw from the syndicate," says Mr. Shirawi. Nevertheless, the British shareholders and others remained.

At the beginning, Mr. Shirawi says, there was no great enthusiasm for Bahraini participation in the project. "Everyone was telling us it was going to be a 'white elephant.' But as it turned out, they were all quite wrong."

At the same time, a construction consortium was formed. This was British Smelter Constructors (BSCCL), whose shareholders were Wimpsey, Amari and John Brown Engineering. The initial planned production capacity of the smelter was 56,000 metric tons a year, but this was soon to change. The foundation stone for the new plant was laid by the Emir on Jan. 23, 1969. In May 1971, the smelter was officially inaugurated.

On Aug. 8, 1968, Aluminium Bahrain was incorporated by charter. The first board meeting took place in Paris on Sept. 8, when R.O. "Nick" Gutteridge, a director of bankers Guinness Mahon, was elected ALBA's first chairman. Mr. Shirawi and Mr. Al Alawi were chosen as directors representing the Bahrain government. Immediately prior to the

During the next decade, several changes in the company structure took place. Today, ALBA has three shareholders: the Bahrain government (77 percent), Saudi Public Investment Fund (20 percent) and Breton Investments of Germany (3 percent). M.L.F.

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Moving Up The Ranks: Work on the Fast Track

Eighty-one percent of the 2,300 workers at ALBA are local Bahrainis. More than 10 percent of them have been with the company for 20 years or more.

Typical of long-staying ALBA employees is Ahmed Ghuloom, who has risen from the ranks of pot-room laborer to superintendent.

A laborer in 1971, he now oversees 100 people

education and then continued without a break at the Apprentice School of Bahrain Petroleum Company (Bapco).

He joined ALBA in 1971 and became a "lead man" with a group of five or six workers in the pot room, where the aluminum oxide is processed into aluminum. "We all came for the money, as the salaries at ALBA were much better than those offered by other companies," says Mr. Ghuloom.

Mr. Ghuloom, 42, went to the local government school for his early education and then continued without a break at the Apprentice School of Bahrain Petroleum Company (Bapco).

After seven months, he was promoted to shift supervisor — a position he maintained until 1974. Then he became pot-room superintendent, in charge of 70 workers responsible for operating a complete line of 114 pots.

Mr. Ghuloom became one of the many workers selected by ALBA to



Inside one of the potlines: pouring new molten aluminum from a tapping crucible for transportation to the cast house.

take technical education courses to help further his career within the company. In 1979, he went to Loughborough College in England to do a two-year course in mechanical engineering. He married just after starting the course and took his wife with him. He now has six children — three boys and three girls. One daughter, Moma, is studying medicine in Bahrain.

In 1981, he returned to the pot room in ALBA. "The course gave me a much wider understanding and better knowledge," he says, "and I deputized as acting manager on many occasions."

He compares the attitude of today's management with that of the early 1970s. "When I joined in 1971," he says, "there were no courses, no training — nothing at all. It was all 'on-the-job' training and experience. We had to learn as we went along. Now it is so different." His education and training are still continuing. Between 1987 and 1989, he studied for an engineering diploma at Bahrain University, and he has also done a diploma course in management studies with Loughborough College. More recently, he was sent to Saint-Jean de Maurienne in France for a six-week familiarization course on the Pechiney technology.

Mr. Ghuloom has been in the unique position of having helped start up some of the first pots in the aluminum-production process as well as the latest ones in the new potline No. 4. He now supervises just over 100 employees in the pot room, where they have been busily bringing the new pots on stream.

"The working conditions today are very different from what they were," says Mr. Ghuloom. "Under normal circumstances, we work an average of nine hours, instead of eight. We start at 6 A.M., and I immediately have a chat with the

night supervisor to see if there have been any difficulties. We do the rounds of the pots, and then he goes off work, leaving me in charge.

"I check the operational procedures and sort out any problems with 'sick pots' — perhaps a pot is not covered properly, for example. These are usually small problems, when things are not done quite right. And then, of course, we have to make sure that all our safety procedures are being followed.

"At 9 A.M., we have a coffee or tea break, which is sometimes combined with a meeting. There is always at least one meeting a day with managers, supervisors and some of the workers to discuss aspects of the job — especially safety, which is most important.

"At 12, we break for lunch — just half an hour. I go to the canteen, where I get a meal for 600 fils (\$0.23). The other shift workers in the potline eat on the job as they cannot leave the production process. Special catering vans come round to them."

Mr. Ghuloom is supposed to finish his shift at around 2:45 in the afternoon; because of the deadline to get the new plant up and running, however, he has had to work many long hours.

"Often, we have been doing an average of 10 to 16 hours," he says. "There has been so much to do — training, learning about new equipment and meeting technicians and contractors. Some of us get extra pay for the overtime, others do not. But we are proud of what we are doing, and we want to do a good job for ALBA."

When he finally finishes work, he goes home, washes up and sleeps for while. "Then, maybe my wife and I go out for the evening. Sometimes I like to go bowling — or play darts," says Mr. Ghuloom.

MLF.

Training Program Taps 'Brain Bank'

When the Aluminium Bahrain expansion project began, the company embarked on one of the largest — and probably the most costly — intensive industrial training programs ever undertaken in the Gulf. ALBA's training program involved more than 250,000 training man-hours costing 5 million Bahrain dinars (\$1.9 million).

About 500 specially recruited Bahrainis as well as many of the existing work force took part in various training programs to upgrade their existing expertise and to learn new operating techniques and skills.

Personnel office gets 20 to 30 applications a day

"We had to concentrate on a two-year program to train people to work on the new potline No. 4, as we had to create an extra-skilled work force," says Ahmed Tahery, who has been ALBA's acting training manager for the last three years. "It has been a great challenge for us. We are responsible for all training in the company, from administration to production."

According to Gudvin K. Tofté, ALBA's chief executive, the company has always been renowned for the high caliber of its employees and their commitment to training. Addressing a group of more than 150 recently qualified trainees earlier this year, he commented: "Such a commitment reflects our conviction that training should be considered neither a privilege nor a gift, but the one avenue we have to continually strengthen the proficiency of our manpower resources."

Today, Bahrainis make up 87 percent of the total work force and 90 percent of the management positions within the company. To a large extent, Bahrain has always had the reputation in the region as being the "brain bank" of the Gulf. Manpower-development strategy applies to all grades of employees. Expatriates are employed on the understanding that a specific part of their job is to help train a Bahraini replacement.

The construction of the No. 4 potline has created another 500 jobs, almost all of which have been filled by Bahrainis.

"We need more intellectual ability these days," says Mr. Tahery. "Our workers have to use their own logic and common sense. Consequently, we have had to do some very extensive training in all production departments so that our workers can familiarize themselves with new techniques and operations."

New workers are generally recruited from two main sources: graduates from the University of Bahrain with diplomas and certificates in engineering, which are equivalent to Britain's Higher or Ordinary National Certificates; and graduates from the local technical schools.

"The first group would consist of students aged around 22 who have never worked before," says Mr. Tahery. "This represents a great challenge for us, as we have had to prepare them for high-tech jobs in the smelter. Our aim is to achieve the highest degree of competence within the industry — and we are doing that. But fine-tuning the mind to new tasks and responsibilities does take time. We do not want people to just press a button and see something happen — we want them to understand why the process takes place."

ALBA works closely with many of its suppliers on training programs to handle new equipment and systems. "For example, some 35 supervisors and superintendents on the production side have been to Aluminium Pechiney plants in Holland and France," says Mr. Tahery. "Others have been to ABB Fläkt factories in Norway." About 100 employees in all have been to Pechiney plants.

The training programs have prepared the new work force for the No. 4 potline and the new carbon-baking plant, where carbon blocks are made for the anodes and which is used in the electrolysis process. Employees have also been trained for work in the new power station. More than 50 supervisors and assistants have been to ABB Mannheim in Germany for training; this is part of a \$2 million program.

According to Mohamed Jaffer Shabib, ALBA's personnel manager, there is no shortage of Bahrainis wanting to work for ALBA. "We receive between 20 and 30 applications a day. Unfortunately, there is a very stable turnover of staff. About 10 percent of the 2,300 workers have been here more than 20 years and 70 percent over three years. We offer very competitive salaries compared with other local employers. Nonsupervisory staff begin with a minimum of 250 Bahrain dinars a month in the potline, rising to 300-400 Bah-

rain dinars as trained laborers. They have 28 days leave plus 12 statutory holidays and an eight-hour shift five days a week. We also allow up to 26 days a year sick leave."

There have been major improvements to the working environment over the years, particularly in the potrooms known for high ambient temperatures. "Soon it will be like working in an air-conditioned workshop," says Mr. Shabib. In the past, employees have either left for "cleaner" work or to further their education.

Mr. Shabib says the company is also making every effort to improve environmental safety and working conditions. "This is a maximum priority and an ongoing effort for ALBA," he says. "We try to take every precaution possible, and everyone is trained in safety. It is a fact that 90 percent of all accidents are avoidable."

One of the most successful innovations in labor relations and workers' participation was the formation of a Joint Consultative Committee in 1974. Ten members — five from the work force and five from management — are elected to the JCC every three years. Each department, or sec-

ALBA is renowned for its high-caliber employees

tion, in ALBA also has its own committee, which is elected every three years. "This is the only system of its kind in Bahrain," says Mr. Shabib. "It is important in helping to educate and train our personnel on how the whole smelter operates." Mr. Tofté says that "the JCC is an invaluable tool for fostering a positive and harmonious working environment within ALBA."

ALBA is also generous in medical care; it will send staff abroad for treatment, contributing 90 percent of all costs — including air fares and hotels. All employees participate in a government health-insurance scheme, and some senior management are also insured for life under ALBA's own plan. As part of the company's general welfare policy, low-cost loans are made for housing construction and improvements.

MLF.

TECHMO

To the Government of Bahrain and the Board of Directors of Aluminium Bahrain

This is an opportunity for us to thank the Government of Bahrain and Aluminium Bahrain Management for the twenty-two years of intense and loyal cooperation which have enabled both companies to achieve very satisfactory results.

It is also an opportunity to express our admiration for a people who, in the space of a few years and guided by an enlightened leadership, have reached the highest levels of social and economic progress.

TECHMO

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ADVERTISING SECTION

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More Than 400 Companies Involved in Expansion

Because of the complex nature of the expansion and construction of the new potline, which involved the latest Aluminium Pechiney technology, no single company took full responsibility — other than ALBA itself.

While it has brought together technology, construction know-how, equipment and supplies from all over the world, ALBA has in fact masterminded the \$1.5 billion expansion.

This has involved two main projects — the construction of the new potline and upgrading of the existing production facilities, and the erection of a

major purchase orders were placed for specialized equipment and materials. Numerous companies worked as contractors, subcontractors and suppliers, bringing the total number of companies involved to about 400.

The engineering, procurement and construction management of the potline was undertaken by Bechtel, which also designed and engineered certain civil construction works. It also looked after a number of the associated production facilities — the anode and rodding plant, the paste plant, 'bake house and the cast house.

"We also provided a lot of the utility services — cafeteria, laundry, the new causeway to the marine terminal and various haul roads," says R. ("Randy") Campbell, Bechtel's construction manager. He speaks highly of the cooperation received from the Bahrain government and ALBA's management and of the high standard of work done by some of the local contractors.

Potline completed a month early

new power station. During the peak period of activity, some 5,500 workers were engaged on the site at any one time; this has been one of the largest single construction projects in the Gulf since the boom days of the early 1980s. Local and regional contractors won about \$350 million worth of business.

Bechtel Ltd. provided the managing construction consultants for the smelter side of the project, and Ewbank Preece Ltd. supplied the consulting engineers for the power station. Contracts for the smelter expansion were divided into 64 packages, including 12 turnkey contracts. In addition, 45

contracts: handling and storing fluoride and cryolite, a storage and handling system for the anodes, construction of the new rodding shop and modifications to the existing shop, and a raw-materials handling system. These contracts have involved building giant silos to store the various materials and the construction of new handling facilities at the marine terminal, which has been connected by a new causeway road.



Gas-clearing plant and solid-bath unloading station for the new No. 4 potline.

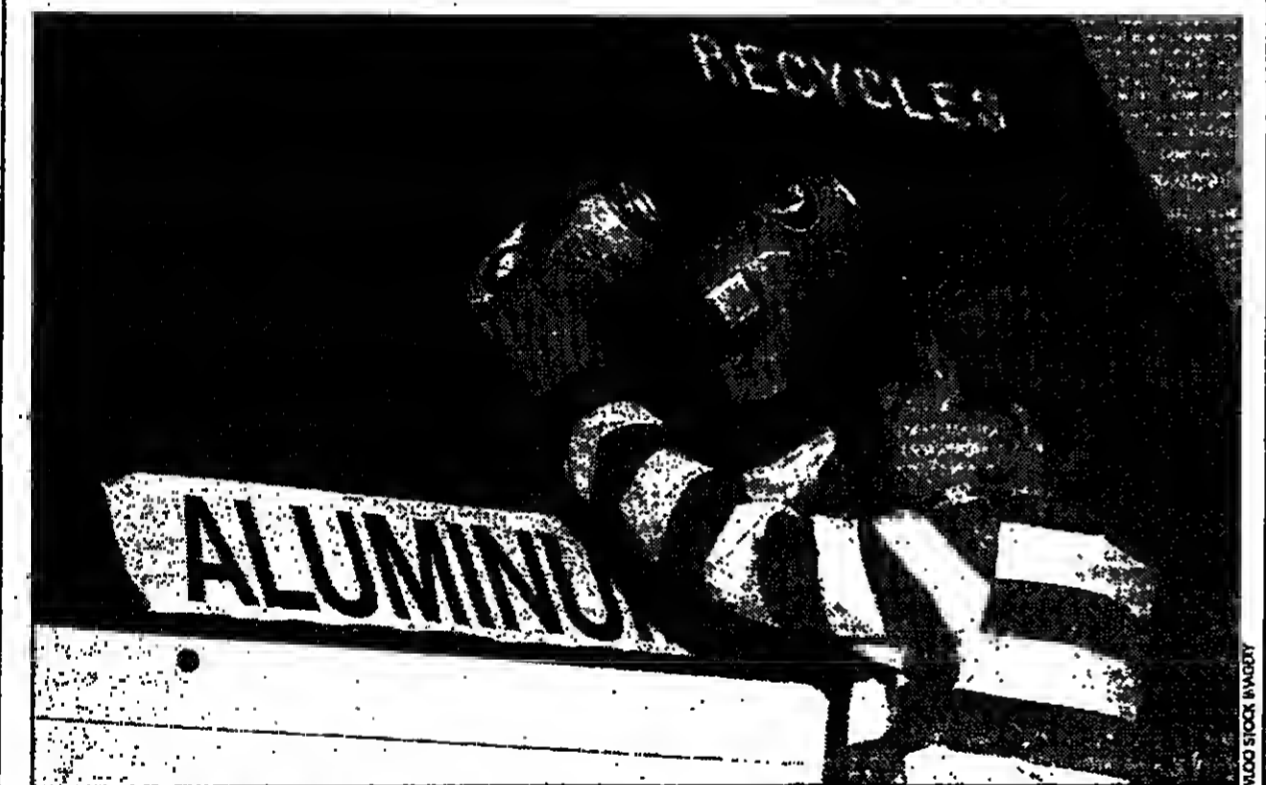
rate contracts: handling and storing fluoride and cryolite, a storage and handling system for the anodes, construction of the new rodding shop and modifications to the existing shop, and a raw-materials handling system. These contracts have involved building giant silos to store the various materials and the construction of new handling facilities at the marine terminal, which has been connected by a new causeway road.

Expertise, materials and equipment came from many countries and from both big and small contractors. N.V. Gouda Vuurvast of the Nether-

lands provided the essential refractory bricks for the baking kilns. It has been making these specialized bricks, which can withstand ultrahigh temperatures, for more than 90 years. Similar know-how was provided by Nasbeuer LOI Company, part of the LOI Group based in Essen, Germany; the company supplied the cast house furnace system in cooperation with the French company, Brochot.

Maximum efforts have been maintained throughout the project to ensure that the tightest quality control was exercised. This also applies to the raw materials for the smelter and production of the aluminum metal itself from the new potline and from the retrofitted reduction cells in the older potlines.

Maximum efforts have been maintained throughout the project to ensure that the tightest quality control was exercised. This also applies to the raw materials for the smelter and production of the aluminum metal itself from the new potline and from the retrofitted reduction cells in the older potlines.



Now a major industry: Recycling aluminum is not only environmentally friendly, but also highly profitable.

From Cans to Scrap, Again and Again

In this age of increasing concern for the environment, it is worth noting that aluminum is one of the most easily recyclable metals in use today. Aluminum can be reused over and over again and melts at a temperature of approximately 1,220 degrees Fahrenheit (660 degrees centigrade) — steel melts at 2,700 degrees F — using only 5 percent of the energy required to make it from ore. Scrap aluminum has been reused since the beginning of the industry, and one-third of the aluminum produced is now made from scrap from manufacturing operations.

of new jobs in the recycling industry and the conservation of raw materials. The aluminum beverage cans used today are 30 percent lighter than those used 20 years ago, making for further savings. Aluminum cans can be turned in to recycling centers, which are now ubiquitous in the United States, or to reverse vending machines, which accept used cans. In addition, many other aluminum products are recycled, from window frames to auto parts, and the aluminum industry is increasing its efforts to reuse other products. Some 70 percent of the aluminum used in electrical engineering, building and transport is already being recycled.

United States recycled 57 billion cans in 1991

Quality Bidding: Who Won the Contracts?

At least \$350 million worth of business has gone to Bahraini and regionally based companies working on the expansion and new power station.

More than 70 local Bahraini companies were awarded contracts or subcontracts worth \$213 million for the construction of the No. 4 potline. Another \$54.8 million worth of contracts went to other companies from the five other states belonging to the Gulf Cooperation Council. About \$68 million worth of business has gone to seven major subcontractors working on the new power station. The overall project has shown that Bahraini and other regional companies were capable of producing equipment and materials under exacting quality-control conditions and according to the highest specifications demanded by their main international contracting partners.

in kit form from the Spanish Inespal factory, involved a lot of aluminum welding, a very specialized operation. "I think we were probably the only company on the island that could do this type of welding," says Peter Smith of Airmech. The company was also responsible for installing and fabricating many other parts of the existing and new facilities connected with potline No. 4. These included the fume-collecting ducts and centers — which needed more than 3,000 metric tons of fabricated steelwork — and electrical installations to the central-control buildings and computer rooms.

"The work has given us a tremendous boost," says Abdullah Ahmed Nass, chairman of A.A. Nass, one of Bahrain's leading engineering and building contractors. It has had up to 2,000 workers on more than \$50 million worth of contracts. "One of the main tasks was the civil works for the power station as a subcontractor to ABB SAE Sadeimi," says Mr. Nass. "We provided all the concrete for the station from our own ready-mix company. This had to be made to the strictest specifications so that the station would not collapse in the next 100 years."


A Saudi company from Jeddah, Hidada Ltd. — part of Xenel Industries, which specializes in structural steelwork and fabrication — provided the steelwork for the anode bake building. Hidada, a leading Saudi company in the steel-fabricating industry, has become increasingly active outside the kingdom. It also makes distribution and lighting poles for the electricity industry.

Nass has been working with the Al Zamil Group on fabricating the reduction cells, or "pots," in which the aluminum is produced. Nass made 120 pots and Al Zamil 170 at the rate of about three or four a week. Each steel pot weighs 37 metric tons; the pots are among the largest of their kind in the world. The company got the pot contract just before the Gulf war started. "We only stopped work on the first day, when an air strike took place," says Mr. Nass, who is particularly proud of making the pots. "Many people thought work like this could not be done here. Now, we have had inquiries for similar jobs from other countries, for example South Africa."

Electrical work has also been done by Comsip Al A'Ali, the local partner of the French electrical-engineering group Cegelec, which is part of the Alcatel Alsthom Group. Comsip Al A'Ali specializes in instrumentation and process-control systems, which have been fitted to the No. 4 potline. Other electromechanical installations for the potline and cast house have been provided by the Al Khajjah Establishment. The company, which has a \$40 million turnover, has also provided \$4 million worth of filtration equipment for the new power station.

Some of the key steelwork for the new potline expansion was also done by Airmech Eastern Engineering, part of Bahrain's Mohammed Jalal Group. Airmech specializes in steel fabrication and structural engineering. It gained more than \$73 million worth of contracts, one of the largest amounts to go to a single local company. Airmech had about 800 workers solely on ALBA projects. At peak times, this went up to 1,600.

Logistics were a major part of the expansion project. Half-a-dozen transportation contracts were won by Bahrain's Turk Heavy Transport, which moves more than half-a-million metric tons of materials and equipment. Steel beams more than 30 meters (98 feet) long and weighing up to 40 metric tons each were typical freight carried by Turk. "We could only drive after midnight through Bahrain with some of these loads on special dollies," says Khalid Turk, whose father founded the company 31 years ago. "Sometimes it took as long as three hours just to go the 22 kilometers from the port to the ALBA site."




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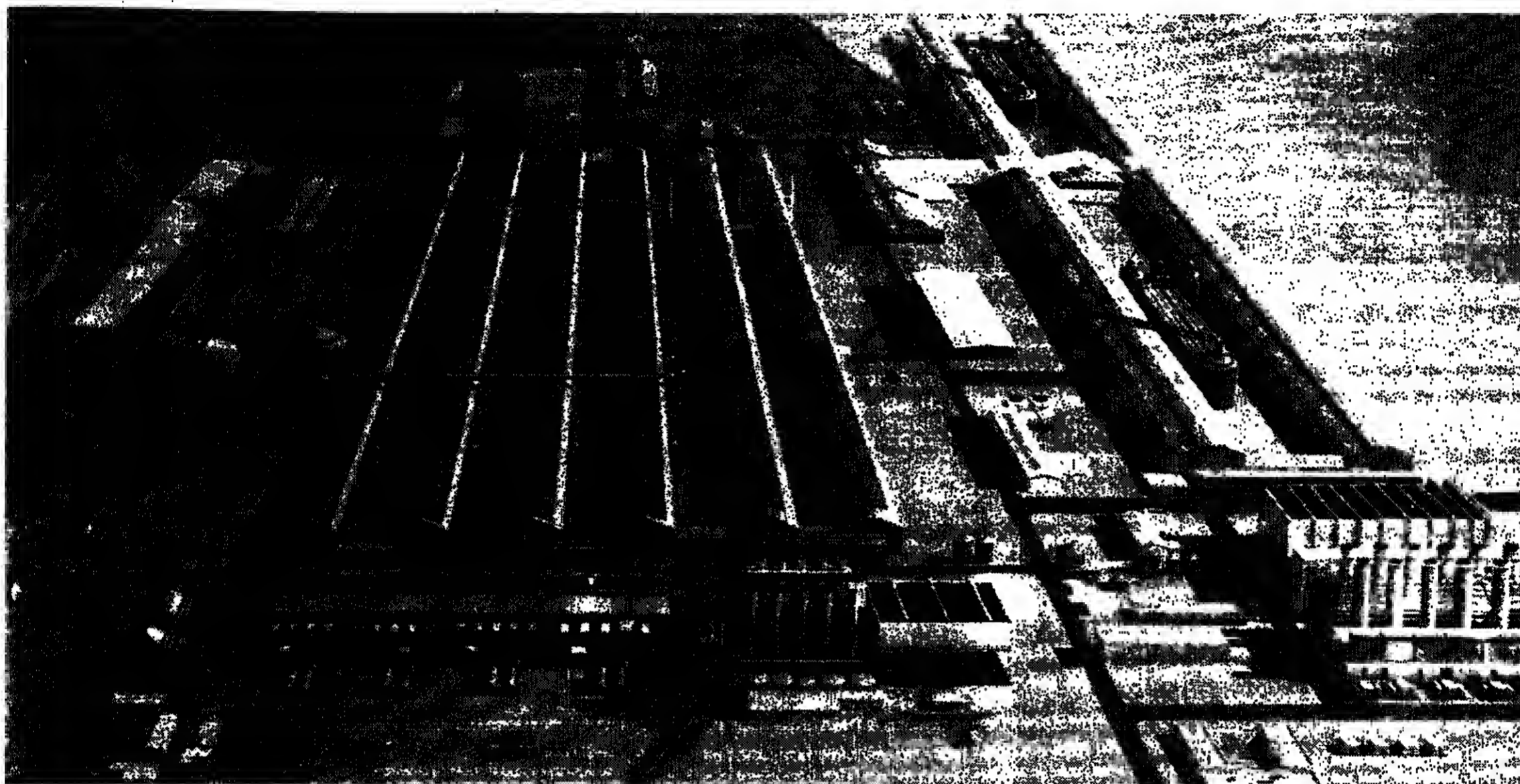
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the world's largest, cleanest and most efficient smelters.*

*ALBA has successfully brought on-stream a 235,000 tonnes per year
smelter expansion and 800MW combined cycle power station,
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*The Company has taken advantage of state-of-the-art
technology to target the highest international standards
of environmental protection and manpower efficiency.*

*Although the Gulf War broke out in the midst of construction, production
commenced one month ahead of schedule and within budget.*

*Such an unparalleled achievement is testimony to ALBA's proven track
record as a reliable producer of superior quality aluminium.*

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WEEKLY INTERNATIONAL BOND PRICES

Provided by Credit Suisse First Boston Limited, London, Tel: 322 40 00. Prices may vary according to market conditions and other factors. Nov. 27

Canadian Dollars

Table of Canadian Dollar bond prices with columns for Issuer, Con, Mat, Price, Yld, and Trd.

Table of ECU Straight bonds with columns for Issuer, Con, Mat, Price, Yld, and Trd.

Table of Pound Sterling bonds with columns for Issuer, Con, Mat, Price, Yld, and Trd.

Table of Van Straights bonds with columns for Issuer, Con, Mat, Price, Yld, and Trd.

Table of other international bond prices with columns for Issuer, Con, Mat, Price, Yld, and Trd.

Table of other international bond prices with columns for Issuer, Con, Mat, Price, Yld, and Trd.

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Table of other international bond prices with columns for Issuer, Con, Mat, Price, Yld, and Trd.

NEW YORK CAPITAL

Table of New York Capital bond prices with columns for Bond, Bid, Ask, and other details.

MUTUAL FUNDS

Figures as of close of trading Friday, Nov. 27

Table of Mutual Funds with columns for Fund Name, Bid, Ask, and other details.

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CAPITAL MARKETS

A Year-End Truce Stalls Attack on EC Currencies

By Carl Gewirtz International Herald Tribune

PARIS — A long-rumored financing for Britain, part of its operations to rebuild the reserves lost in September's unsuccessful effort to keep the pound in Europe's exchange-rate mechanism, is expected to emerge this week. A jumbo bond issue of at least \$4 billion is likely to be the last major financing on the international capital market this year.

Tension is likely to flare in the new year if the Bundesbank doesn't act.

Bankers see a "window of opportunity" remaining open for the next 15 days, after which the market will turn to the year-end holidays. Although market rumors had Britain weighing the possibility of issuing in French francs — highly unusual given the rivalry between London and Paris — the dollar and Deutsche mark sectors are currently the only markets capable of absorbing such a large issue.

En Masse, Americans Deck the Malls

By Stephanie Strom New York Times Service

On the day after Thanksgiving, the busiest shopping day of the year, crowds in American stores were bigger than they had been in the last two or three years and shoppers seemed to be spending more than in the past, retailers said over the weekend.

But Tool Orders Fall Off

Bloomberg Business News

WASHINGTON — U.S. machine tool orders declined 24.9 percent in October from September as the weak economies of the nation's trading partners cut exports in half, an industry group said Sunday.

Kohl Presses Tax Plan and Solidarity Pact

Compiled by Our Staff From Dispatches

BONN — Chancellor Helmut Kohl, pushing the idea of a "solidarity pact" among government, business and labor unions to speed recovery, pressed Sunday for rapid enactment of new taxes that would come into effect in 1995. Mr. Kohl, in a radio interview, said the imposition of an income tax surcharge was a "possible solution" to the problem of financing Eastern Germany's debt of 400 billion Deutsche marks (\$250 billion).

U.S. Bankruptcy System Owes Itself an Overhaul

By David S. Hilzenrath and Michelle Singletary Washington Post Service

WASHINGTON — One day in 1990, as Donald Trump tells it, he and the model Maria Maples were strolling along New York's Fifth Avenue when they passed a beggar. "You see that man? Right now he's worth \$900 million more than me," Mr. Trump said. "Right now I'm worth minus \$900 million."

Rather, the lenders were reluctant to confront Mr. Trump in bankruptcy court, where they would face years of delay and massive legal expenses. In the end, they feared they would recover less money in bankruptcy than they could get by striking compromises.

strong position that creditors "have to buy them off."

After a decade of profligate borrowing, Mr. Trump lacked the cash to make his loan payments. Although he owned hotels, skyscrapers, casinos and an airline, his debts exceeded the value of his properties by hundreds of millions of dollars.

What happened to Mr. Trump is a testament to a breakdown of America's bankruptcy system, according to bankers, lawyers, accountants, academics and other experts. The system has become such a quagmire that lenders are going to great lengths to avoid it.

Some borrowers who go broke negotiate deals that enable them to avoid bankruptcy altogether. Others get caught up in bankruptcy proceedings but hold on to small fortunes because their lenders get tired of fighting.

His lenders could have forced him into personal bankruptcy and stripped him of almost everything. But that didn't happen. Instead, the bankers and investors to whom Mr. Trump owed money made a series of deals that left him wealthy. They let him keep some properties and took control of others, and they reduced his personal debt by about \$750 million, more than four-fifths of the total.

When Congress last overhauled the bankruptcy laws in 1978, it sought to make it easier for people and businesses to recover from financial ruin. But in practice, the system Congress created favors debtors over creditors, the people who own money over the people to whom it is owed, many specialists say.

When Congress adjourned last month, its unfinished business included a bill that would have helped streamline the bankruptcy system and eliminate what critics say are flaws that benefit borrowers like Mr. Trump.

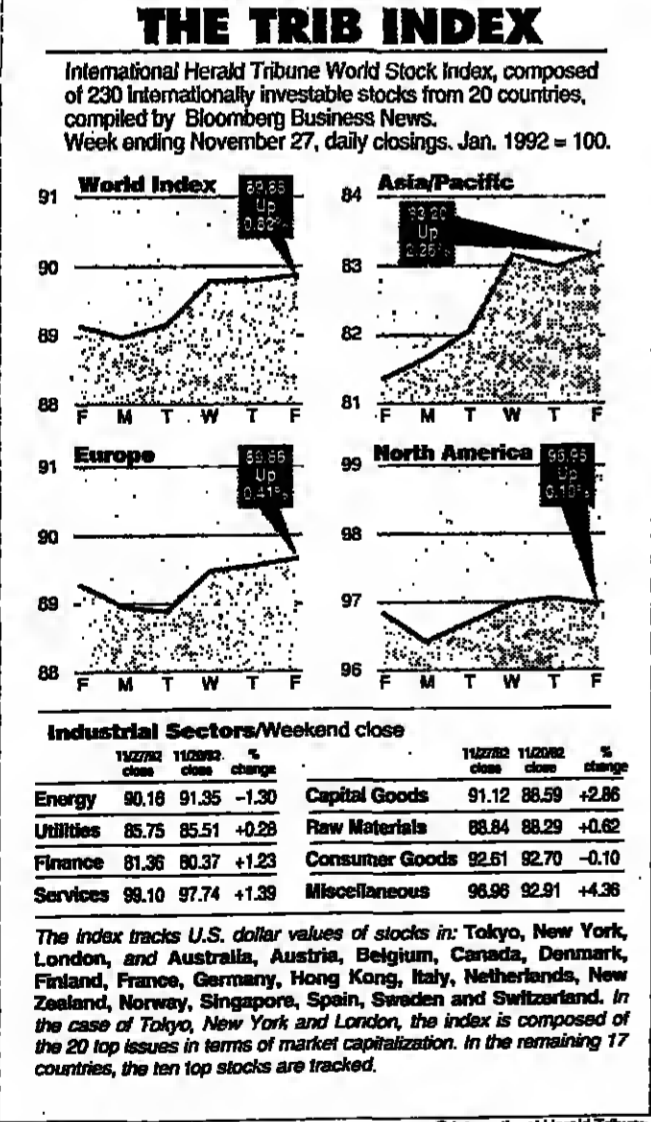
Report of Loss at VW

Volvo Group AG will have an operating loss of 1.1 billion DM in 1992, Der Spiegel reported.

But a VW spokesman said there was "nothing new" about the company's results, adding, "We have known for quite a while that our costs are too high and our productivity too low." He noted that VW never gives details of operating results.

Last Tuesday, VW said group net profit fell 12.6 percent to 549 million DM in the first nine months of the year.

Debtors also can hold on to property too long, and are often allowed by judges to extend the time for filing a plan that explains what the debtor is doing.



London Notebook

Is British Trade Heading Down a 'Black Hole'?

Britain is about to fly into a statistical black hole and the timing couldn't be better. Amid growing concern over its swelling trade deficit, the government will sidestep the issue by not publishing figures for trade with its European Community partners for at least the first six months of 1993.

Government statisticians blame the single European market — due Jan. 1 — for the forthcoming lull. As of that date, the government will ask British companies to fill out forms on trade with the Continent that will take the place of the old reporting system, which was based on import taxes and export licenses.

Insolvency Sells

Barbara Freeman is one of the few Britons in recent months to have found inspiration in the headlines of the local business press. The daily litany of layoffs and retrenchments is depressing stuff, unless you're thinking about starting up a publication called "Insolvency Bulletin."

Chris Poole, Mr. Michael's spokesman, says that his client would rather not record again his high-tech record for Sony. Sony takes a markedly more upbeat view. In London, a Sony spokesman quoting what he called the "official response" of Sony U.K.'s American parent.

Mr. Michael found himself working for Sony by accident. Ten years ago, when he was half of the pop group "Wham," he signed up with CBS Records, which was subsequently sold to Sony.

Greening of the Metals

A half-century ago, Britain still had its empire, the London Metals Exchange was the largest metals market in the world and none dared question the propriety of all of its prices being quoted in sterling. Now they do.

Paris Aide Likens Farm Veto Threat To The Big One

Reuters

PARIS — The French threat to veto a world trade deal to win farm concessions from the United States is like a nuclear deterrent it hopes it will not have to use, Industry and Trade Minister Dominique Strauss-Kahn said Sunday.

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Ireland Holds Firm On Value of Punt

Compiled by Our Staff From Dispatches

DUBLIN — Ireland dismissed speculation over the weekend about an imminent devaluation of the punt and reiterated its determination to defend the currency within Europe's exchange-rate mechanism.

Officials said Finance Minister Bertie Ahern on Saturday briefed cabinet colleagues on meetings in Brussels about the turmoil on European currency markets. EC foreign and finance ministers met Friday to discuss budget and other issues.

The Irish cabinet decided to make no policy change. "Government policy in this regard is unaltered," one official said. Mr. Ahern had earlier denied market rumors that Ireland could devalue as early as this weekend after Wednesday's elections prompted uncertainty over the formation of a new government.

He and the rest of the Fianna Fail administration remain as a caretaker government until the Dec. 14 deadline for selecting a new coalition. Negotiations are not expected to be concluded before that date. Officials said Saturday that the cabinet "recognized its responsibility in maintaining stability pending the formation of the next government."

State-of-the-Art Television Broadcast and Studio Equipment

Over 8 million dollar valuation of current generation TV broadcast and studio assets surplus to the continuing operations of The Christian Science Publishing Society. Highlights include: Sony D3-LMS, Sony SVP-270 & ENG camera systems, (75) Sony Betacam SP & D2 VTR's, On-Air master control system, Chyron Infinis & Ampex ADD-1000s, Letich still stores, D1 & NTSC, Extensive ENG camera equipment including tripods, audio & battery gear, and lighting packages.

CURRENCY RATES

Table of currency rates for various locations including London, New York, Tokyo, and others, with columns for currency, rate, and change.

ASDAQ NATIONAL MARKET

OTC Consolidated trading for week ended Friday, Nov. 27.

Table with columns: Sales in 100s, High, Low, Close, Net Chg. Lists various OTC stocks and their trading data.

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Main financial data table with columns: Sales in 100s, High, Low, Close, Net Chg. Lists various OTC stocks and their trading data.

(Continued on page 23)

New International Bond Issues

Table listing various international bond issues with columns for Issuer, Amount (millions), Maturity, Coupon, Price, and Terms.

Market Set for Further Gains
Chance of Fed Tightening Is Seen as Remote

NEW YORK — U.S. Treasury bond prices are likely to improve this week based on expectations of a moderate increase in nonfarm employment and a newly relaxed attitude toward Federal Reserve policy, analysts said.

Restoring — U.S. Treasury bond prices are likely to improve this week based on expectations of a moderate increase in nonfarm employment and a newly relaxed attitude toward Federal Reserve policy, analysts said.

degree of tightening built into this level is appropriate. A sluggish jobs picture may conflict with other data suggesting expansion, but analysts said this is because productivity has been stepped up at the expense of jobs.

China Puts New Hope In U.S. Trade Forum

BEIJING — The resumption next month of regular U.S.-Chinese ministerial-level trade talks, suspended after the 1989 Tiananmen crackdown, will help improve relations overall, a government spokesman said on Sunday.

Aide Takes Blame in India Scam

NEW DELHI — India's central bank governor has accepted moral responsibility for lapses leading to a huge securities scam that wiped billions of dollars off share values, a legislator said over the weekend.

The Week Ahead: World Economic Calendar, Nov. 30 - Dec. 5

Table detailing the world economic calendar from Nov 30 to Dec 5, listing events such as interest rate decisions, trade talks, and economic reports for various countries.

RATES: Year-End Truce Stalls Attack on Currencies

(Continued from first finance page) of interest rates. "Interest rates are too high for the current economic environment in Europe," said Laurence Kantor, chief European economist for J.P. Morgan in London.

against the franc in the new year might be a dramatic political gesture. One such gesture would be for the French government to give the Bank of France its independence, a step that could be followed by a pooling of reserves with the Bundesbank.

locked in a range of 1.55-1.62 DM. Although the latest U.S. economic data has been more upbeat than most economists had been expecting, analysts are wary that the statistics may be exaggerating the underlying strength of the economy.

Talks Are Planned on Torras Affair

BARCELONA — Senior officials of the Generalitat Government office are to meet in the next few days with Spanish authorities to discuss the serious financial difficulties of Grupo Torras SA, several sources said over the weekend.

Acknowledging that he had recently met with KIO's senior Kuwaiti officials, Mr. Solchaga confirmed that KIO might file legal proceedings against the executives formerly responsible for its interests in Spain.

The Madrid reported Cambio 16 said in its latest issue that the "shortage" for which the de la Rosa team was responsible affected the majority of group companies, including 125 billion pesetas at Erccos, 86 billion at Prima Inmobiliaria and 107.5 billion at Grupo Torras itself.

RUSSIA: Economic Doom Defied, but Politics Looms

(Continued from page 1) credit provided to big enterprises, avoiding hyperinflation and stopping the drop in industrial production — Western officials are more optimistic that Mr. Gaidar can keep to the essentials of his economic program.

price-and-wage freeze, a fixed international exchange rate for the ruble and central control of resource allocation. "They're pulling back, but not all the way back, and we can live with it," a senior Western diplomat said.

Mr. Yeltsin also has taken a more nationalistic line recently, as he has often done when faced with criticism from the self-styled "patriots" of the old apparatus. He has criticized the West for tying its credits to the purchase of Western products, spoken of the need to revive Russian industry and to protect the illegal export of oil, gas, timber and other national "wealth" to the West.

Euromarkets At a Glance

Table showing Euromarket yields for various currencies and maturities, including U.S. \$, Sfrs, and other international currencies.

MUTUAL FUNDS

Table listing mutual fund performance metrics such as 1-month, 3-month, and 6-month returns for various funds.

Last Week's Markets

Table showing stock indexes and money rates for various countries, including the U.S., U.K., Germany, and Japan.

BANKRUPTCY: System Ails

(Continued from first finance page) more than a year to disclose how they will pay back creditors. Congestion in the bankruptcy courts has compounded the delays, giving creditors another reason to avoid the process and negotiate with debtors outside the system, as did Mr. Trump's lenders.

Under a Chapter 11 bankruptcy proceeding, which is typically used by businesses, the same management team that presided over a company's failure is likely to be left in charge. In that case, management has the exclusive right to propose solutions to the company's financial problems. Although the law requires debtors to produce a plan in four months, court-approved extensions are routine and creditors can do little more than wait until a plan is proposed.

The bankrupt bankruptcy bill would have attempted to put an end to the extensions by imposing strict time limits, giving debtors no

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MONDAY SPORTS FOOTBALL



Linebacker Dryan Cox of the Dolphins brought the Saints' quarterback, Bobby Herbert, to the ground in the NFL game in New Orleans.

Redskins Thrash Cardinals, 41-3

Compiled by Our Staff From Dispatches
The Washington Redskins kept their playoff hopes alive on Sunday with a 41-3 drubbing of Phoenix...

Mark Rypien threw two touchdown passes, Washington's defense was strong as usual, and the Cardinals committed three turnovers inside the Washington 20...

After Phoenix (3-9) got a 42-yard field goal from Greg Davis on its first possession to take a 3-0 lead, the defending Super Bowl champions (7-5) scored just their third touchdown on offense in the last 24 quarters when Rypien threw a 13-yard scoring pass to Ricky Sanders...

And just like that, the score became 14-3 Washington when, on the Cardinals' next possession, Redskins free safety Brad Edwards stepped in front of Ricky Proehl at the Washington 47 and returned Timm Rosenbach's pass 53 yards for a touchdown.

It was the first of four interceptions for Rosenbach, who was playing his first full game since he sepa-

rated his shoulder in Week Two. Three were important — two of the others were inside the Washington 10, with one at the goal line. He finished the day 19 of 34 for 262 yards.

The Redskins moved ahead 17-3 on a 32-yard Chip Lohmiller field goal with 2:57 left in the first half, and then the Cardinals' self-destruction continued.

Rosenbach moved Phoenix to the Washington 30 with a little more than a minute left when he hit

NFL ROUNDUP

Proehl at the Redskins 19. However, he coughed up the ball when he was hit by Edwards. Linebacker Wilber Marshall scooped up the ball and advanced it 30 yards, where he laterated to cornerback Alvide Mays just as he was tackled.

Mays gained 26 more, and a personal foul on Phoenix's Larry Centers advanced the ball to the Cardinals 18. Three plays later, Lohmiller hit an 18-yarder as time expired, giving Washington a 20-3 lead at intermission.

Falcons 34, Patriots 6: In Atlanta, Steve Broussard ran for a touchdown and caught a scoring pass, as

the Falcons ended New England's two-game winning streak.

Broussard scored on an 8-yard run and caught an 18-yard pass from Billy Joe Tolliver to help the disappointing Falcons improve to 5-7. New England fell to 2-10.

Tolliver also threw a 10-yard touchdown pass to Drew Hill and rookie Tony Smith broke loose on a 29-yard scoring run. Deion Sanders led Atlanta's defense with third-quarter interception returns of 32 and 18 yards.

Packers 19, Buccaneers 14: In Milwaukee, Brett Favre hit Jackie Harris with a go-ahead touchdown pass in the fourth quarter, and Chris Jacke kicked four field goals as Green Bay won its third straight.

Green Bay (6-6) has now won four of its last five. Tampa Bay (4-8) lost for the seventh time in its last eight games. The Bucs had beaten the Packers 31-3 on the second Sunday of the season.

Fewer completed 26 of 41 passes for 223 yards. Sterling Sharpe, the NFL's leading receiver, had nine catches, giving him 363 for his career — the most ever in a player's first five years.

Trailing 14-12, the Packers moved 69 yards in 15 plays as Favre finished for Harris for a 9-yard

touchdown pass with 10:09 left for a 19-14 lead.

Chiefs 23, Jets 7: In East Rutherford, New Jersey, the Chiefs ended a six-game losing streak at Giants Stadium.

A stingy defense and ball control attack carried Kansas City over the impatient New York Jets, lifting the Chiefs to 8-4, good for first place in the AFC West, and broke a 0-6 slump at the home of the Giants and Jets. The Chiefs have won their last four games.

Saints 24, Dolphins 13: In New Orleans, Robert Goff's 28-yard touchdown runback of a Dan Marino fumble, and Vince Buck's 34-yard interception return for another score ensured the Saints victory over Miami.

New Orleans' defense, which had only allowed one opponent to pass for more than 200 yards all season, gave up 259 yards to Marino, but pressured him throughout the game, sacking him five times, rushing him frequently and scoring twice off the second-half turnovers.

The Saints' five sacks are the most against Marino in his career. He completed 26 of 42 attempts.

Steelers 21, Bengals 9: In Cincinnati, the Steelers sacked David Klingler a club-record 10 times in his NFL debut and had him on the run all afternoon.

Pittsburgh's Barry Foster scored a pair of touchdowns and surpassed Franco Harris' single-season rushing record with his ninth 100-yard game of the season. His 102 yards on 25 carries kept him in the NFL rushing lead (1,319) and steadied an otherwise feeble offense.

Browns 27, Bears 14: In Cleveland, the Browns scored only one of their three touchdowns on offense as the Bears lost their fifth in a row. It is Chicago's longest skid since ending 1989 with six consecutive losses.

The Browns (6-6), who were out-gained 320-178, won with big plays on defense and special teams. David Brandon returned an interception 92 yards in the first quarter, marring Peter Tom Willis' first NFL start, and Eric Metcalfe scored on a 75-yard punt return in the third quarter.

Brandon then recovered Neil Aderson's fumble at the Bears 28-yard line, and a pass interference penalty on Chicago's Lemuel Stinson in the end zone set up Kevin Mack's 1-yard run with 10:35 to play.

(AP, UPI)

Easy Victories Keep Miami and Florida State on Championship Track

The Associated Press
On a day when Miami and Florida State kept their national college football championship hopes alive, Marshall Faulk's Heisman Trophy hopes may have died.

San Diego State's Faulk, the nation's leading rusher, warmed up before Saturday night's game against top-ranked Miami. But his anticipated Heisman showdown with Miami's quarterback, Gino Torretta, fizzled when Faulk and team officials decided his sprained right knee was not fully healed.

Faulk ended the regular season with 1,630 yards. "He's not 100 percent," Coach Al Luginbill said 15 minutes before kickoff. "As much as we would have liked him to play, we can't let him do so if he's not 100 percent."

With Faulk watching from the sideline, Torretta boosted his Heisman chances by completing 19 of 35 passes for 310 yards and one touchdown in Miami's 63-17 romp in San Diego. The senior quarter-

back, who is 26-1 as a starter, left the game near the end of the third period and did not return. Larry Jones and Stephen McGuire each rushed for two touchdowns, and Lamar Thomas

COLLEGE FOOTBALL

caught two TD passes — one a 68-yarder on a pass from wide receiver Kevin Williams.

Miami (11-0) won its 29th straight game and continued its bid for a second straight national championship. SDSU finished 5-5-1.

San Diego State receiver DeAndre Maxwell was ejected after a second brawl, which began after Aztec quarterback David Lowery was knocked out of the game with a bruised leg. In the third quarter, San Diego State lineman Chris Rodahaffer suffered a neck sprain.

No. 3 Florida State 45, No. 6 Florida 24: Charlie Ward passed for 331 yards, ran for 70 and set a

school record for total offense in the rout in Tallahassee. The victory kept the Seminoles (10-1) in the national championship chase. If Alabama loses to Florida next week in the Southeastern Conference title game and Florida State moves up to No. 2, the Seminoles will get a rematch against Miami in the Fiesta Bowl.

The Hurricanes handed Florida State its only loss, 19-16, on Oct. 3. If Alabama beats Florida, Florida State will go to the Cotton Bowl or Orange Bowl, a victory over Alabama would send Florida to the Sugar Bowl. Otherwise, the Gators will play in the Citrus or Gator bowl.

Ward completed 27 of 47 passes and set a single-season school record for total offense with 3,151 yards. The Seminoles had 38 points at halftime, more than any other team had scored against Florida in an entire game this season.

Florida State held the Gators (8-3) to 41 yards on the ground. Florida's leading rusher, Eric Rippet, had no yardage on nine carries.

No. 5 Notre Dame 31, No. 19 Southern Cal 23: In Los Angeles, Tom Carter's end-zone interception with 10 seconds left wrapped up Notre Dame's 10th straight victory over Southern Cal.

The Irish (9-1-1) apparently are headed for a Cotton Bowl match against Texas A&M or an Orange Bowl date with Nebraska. Southern Cal (6-4-1) will play Fresno State in the Freedom Bowl.

Two plays before the interception, Carter was beaten on a 41-yard reception by Travis Hannah that gave Southern Cal first-and-goal at the 5. After Devon McDonald sacked quarterback Rob Johnson for a 7-yard loss, Carter picked off Johnson's pass.

Notre Dame's Reggie Brooks, a 5-foot-8 (1.72-meter), 200-pound (90-kilogram) senior, had 227 yards on 19 carries and scored on runs of 55, 44 and 12 yards.

No. 9 Georgia 31, Georgia Tech 17: In Athens, Georgia, Garrison Heast rushed for 169 yards and three touchdowns, breaking Her-

schel Walker's SEC record for touchdowns in a season. Heast struck a Heisman Trophy pose after his final touchdown, a 4-yard run that clinched the victory with 29 seconds remaining. His other scores came on a pair of 3-yard runs in the third quarter.

Heast scored 21 touchdowns this season, one more than Walker's mark. He also rushed for 1,547 yards, 99 less than Walker had in his Heisman Trophy-winning season in 1982.

Georgia (9-2) will play in the Citrus or Gator bowls. Tech finished with a 5-6 record.

Tech's Shawn Jones, who completed 26 of 46 passes for 305 yards and two TDs, broke the Atlantic Coast Conference record for total offense in a career with 9,296 yards.

No. 24 Mississippi 17, No. 16 Mississippi St. 10: In Oxford, Mississippi, Cory Philpot ran for 107 yards and the go-ahead touchdown, and Ole Miss made three great defensive stands in the final two and a half minutes.

Mississippi State had the ball inside the Mississippi 9 three times in the final minutes, but could not score.

Ole Miss (8-3) is headed to the Liberty Bowl, while State (7-4) is going to the Peach Bowl.

No. 18 Tennessee 29, Vanderbilt 25: In Nashville, Tennessee, James Stewart scored on a 1-yard dive with 1:49 left as the Volunteers rallied to give Johnny Majors a victory in his last regular-season game as Tennessee coach.

Tennessee (8-3) trailed 19-14 before driving 59 yards for the go-ahead score.

After recovering a Vanderbilt fumble, the Volunteers scored again on an 8-yard run by Charlie Garner to make it 29-19. Vanderbilt (4-7) pulled to 29-25 on Marcus Wilson's 3-yard TD pass to Clarence Sevelian, but failed on a two-point pass and could not recover an onside kick.

NASDAQ NATIONAL MARKET

OTC Consolidated trading for week ended Friday, Nov. 27. (Continued)

Table with columns for stock symbols, prices, and volume. Includes sections for OTC Consolidated trading and various market indices.

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MONDAY SPORTS SKIING

Tomba's a Bomba as Aamodt and Tescari Win Season's First Races

Slalom Fiasco Caps Weekend of Woe for All-Italian Hero



A disappointed Alberto Tomba after he fell in the second run of the slalom on Sunday, losing what had seemed to be a certain victory.

By Ian Thomsen
Sestriere, Italy — The giant slalom course required Tomba to make a question mark at its period...

"Yes, that's true," Aamodt agreed. "It's a great feeling and it's my greatest win ever, I think."

Tokai Teio Triumphs in Japan Cup

Compiled by Our Staff From Dispatches
FUCHU, Japan — Tokai Teio, the winner of last year's Japanese Derby, dashed up along the outside to beat the Australian horse Naturalism by a neck Sunday and won the Japan Cup, one of the world's richest horse races.

Romania Beats Cyprus, Milan Wins Battle of Italy

Compiled by Our Staff From Dispatches
Romania defeated Cyprus, 4-1, Sunday in the first leg of their European Group 4 qualifying match for the 1994 World Cup soccer championship.

Soccer Roundup

Roberto Baggio, recovering from a cracked rib, and England midfielder David Platt, out until the New Year after a knee operation last week.

Maier Wins in Slalom For First Cup Victory

The Associated Press
PARK CITY, Utah — Ulrike Maier of Austria, twice a world champion but never the winner of a World Cup slalom race, ended years of frustration by capturing the season-opening women's slalom.

Bowe May Next Defend His Title At Halftime of Super Bowl Game

By William Gildea
WASHINGTON — First it was China. Rock Newman, manager of heavyweight champion Riddick Bowe, thought it would be a good idea if Bowe defended his title against George Foreman in Beijing.

Sidelines

Aoki a 2-Stroke Victor in Japan Golf
KAIMONCHO, Japan (AP) — Isao Aoki of Japan, back from his debut on the U.S. senior tour, shot a one-under 71 on Sunday for a two-stroke victory in the Casio World Open Golf Tournament.

Elkington Wins Australia Open Golf

SYDNEY (AP) — Steve Elkington of Australia kept cool in wet and windy conditions on Sunday to shoot a 2-over-par 74 and score a two-stroke victory in the Australian Open golf championship.

Australia-U.S. Cup Match on Grass

MELBOURNE (AP) — Australia will face the United States in the first round of the 1993 Davis Cup tennis competition on a grass court at Kooyong from March 26-28, Tennis Australia said Sunday.

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Baseball Council May Oust Reds' Owner Schott

By Ross Newhan
Los Angeles Times Service
LOS ANGELES — Major league baseball's executive council will meet by phone Tuesday to begin an investigation into the controversy surrounding Marge Schott, the chief executive officer of the Cincinnati Reds.

ESCORTS & GUIDES INTERNATIONAL CLASSIFIED (Continued From Page 24)

